Self Study

Academic Program Review

Horticultural Sciences    HortSciences.tamu.edu    April 21 - 24, 2013
Cover Photo

The cover photo for the 2013 Academic Program Review Self Study document features a member of the Fightin’ Texas Aggie Class of 2013, Michael Cook. Michael is working toward a Bachelors of Science in Horticulture, and will be pursuing graduate school in viticulture and enology upon graduation in May. Michael is holding a container of Texas maroon bluebonnets, grown by students in the TAMU Horticulture Club for their annual Spring Plant Fair. Texas maroon bluebonnets were developed by Dr. Jerry Parsons, retired Extension specialist, and have become the symbol of Aggie Horticulture. After all, what says Texas more than the Texas bluebonnet, and what could say Texas Aggie Horticulture better than maroon bluebonnets grown by Aggies!
EXECUTIVE SUMMARY

The Texas A&M University Department of Horticultural Sciences has changed considerably since the last Academic Program Review was conducted in 2005. Administratively, a period of strong and consistent leadership has given way to two periods of transition. The first transition was in August, 2011 when the department head who led the department since 2003 took a leadership position in the Borlaug Institute for International Agriculture and was replaced by an interim department head for one year. In August, 2012 the Associate Head for Undergraduate Programs was selected as department head resulting in the filling of the department head position, necessitating a transition in the teaching program. The transition also affected the graduate program resulting in the appointment of a new Associate Head for Graduate Programs. At about the same time, the Associate Head for Extension Programs retired and another faculty member was appointed to take his place.

On the fiscal side, Horticultural Sciences endured the same budget reductions as the University and state agencies, resulting in the department’s FY2013 appropriated budget being 18% less than its FY2010 budget. This loss of funding resulted in the elimination of two non-tenure tracked lecturer positions and the loss of all but one hard-funded research technical support position.

Change has not been positive, but the response it has evoked from the Horticultural Sciences faculty has been one of increased effort, creative use of available resources, increased attention to competing for extramural resources, and a sense of getting the job done with less.

This self-study details the faculty’s efforts and successes in dealing with fiscal adversity. The teaching load of instructional faculty lost to the budget cut has been assumed by those who remain, so that our student credit hours taught have not decreased substantially. Faculty have re-doubled their effort to obtain extramural funds to support their research and variety development programs, and many technical support positions have been transferred to soft-money. Scholarly output has increased from 2008 to 2012 in journal publications as well as in grants generating indirect costs returns to the unit. The Academic Analytics® faculty scholarly productivity index ranked Texas A&M University Horticultural Sciences faculty 5th in 2009, 3rd in 2010, and 5th in 2011 compared to national peers in horticulture. Enrollment in our Ph. D. program has remained steady, our Masters enrollment is higher in 2012 than it was in 2008, and our undergraduate enrollment has increased substantially since the implementation of the Bachelor of Arts in Horticulture degree in 2007. Our faculty is the only horticulture program in the country to offer the BA degree, but it has proven to be an important addition to our offerings. We’re doing more with less.

The self-study also describes the contributions Horticultural Sciences faculty are making to the twelve imperatives of Vision 2020 and to the Action 2015 Education First strategic plan. We are increasing the national standing of Texas A&M horticulture by being more competitive in the national research agenda and being recognized among the leaders in scholarly productivity, our faculty are engaging their peers across departmental and college boundaries in projects as diverse as fruit and vegetables for human health and green roof technology, we are enhancing the undergraduate experience by offering programs that nurture both the art and science of horticulture, our students are increasing their engagement in work experience and international programs, and we are providing broad public access to our information and programs through one of the oldest and most widely used public information servers, Aggie Horticulture.

The Horticultural Sciences faculty await the Academic Program Review with eager anticipation. We are anxious to have a national panel of peers assess the responses we have made to change. We look forward to interacting with administrators at the University and College levels to help us address suggestions for program improvements that necessarily will result from this process.
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Horticultural Sciences Academic Program Review

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Peer Review and Charge

The review team is charged with examining the programs listed below and making recommendations that we may use to inform continuous quality improvement processes. Resources that you will have for this assessment are a self-study to be completed by the Department, other materials that may be provided by the Department and our office, information you gain through personal interactions while visiting Texas A&M University, and any additional information that you request. Within the broad charge of informing continuous quality improvement are the following specific questions that we would like you to address:

1) While evaluating the program, please consider the resource context within which the Department operates (both human and fiscal) and the absolute level of support the department receives from the university. Please comment on the overall efficiency and effectiveness of the department’s use of these human and fiscal resources in pursuit of its mission.

2) Please address the following questions about assessment of learning outcomes:
   a) Has the department identified specific learning outcomes for its educational programs?
   b) Please comment on the appropriateness of these learning outcomes for this department.
   c) Does the curriculum and instruction afford students opportunity to achieve the learning outcomes?
   d) Does the department have a written plan for assessment of its identified learning outcomes? Is that plan of acceptable quality? Are the metrics used for assessment appropriate and of acceptable quality?
   e) To what extent is the Department successful in achieving its learning outcomes?
   f) Does the learning outcome assessment process inform continuous quality improvement?

3) Please share with us any strengths, weaknesses, opportunities, and threats related to the current and future quality of each or all of these academic programs.

4) Please comment on the scope, efficacy, and desirability of current and potential collaboration of this department with other departments and groups, both on campus and off.

5) Please provide us your team’s judgment on the national ranking of this Department, as a percentile rank. For example, is this Department in the top 5% of programs in horticultural sciences nationally? Top 10%? Top 50%?

6) Please address the department’s contributions to two guiding strategic initiatives developed by Texas A&M University. The first of these is a document developed in 1999, entitled Vision 2020: Creating a Culture of Excellence, and identifies twelve specific areas of focus for Texas A&M’s future. The other is the more recent Action 2015: Education First, intended to build on our gains made since the inception of Vision 2020. Both documents may be referenced at http://provost.tamu.edu/strategic-planning-2010. Summaries of both documents will be provided upon your arrival at Texas A&M University.
I. INTRODUCTION TO THE SELF STUDY

This self-study document was created as part of the requirements for the comprehensive Academic Program Review, a process through which Texas A&M University fulfills the mandate of the Texas Higher Education Coordinating Board to review all doctoral programs every seven years. The University has extended the review process to include all aspects of departmental programs to include undergraduate and graduate programs as well as research, service, and engagement activities. The Department of Horticultural Sciences graduate programs were reviewed last in May, 2005. Except where noted otherwise, the self-study refers to the 5-year period of 2007-2012 as directed in the Academic Program Review Guidelines document.

Historical Perspective of Horticulture at Texas A&M University

The practice of horticulture has been taught at Texas A&M University since its founding as the A&M College of Texas in 1876. Dr. Carlisle P. B. Martin, a professor of practical agriculture, taught in the Department of Agricultural and Scientific Courses and his subjects included chemistry, farm tillage, horticulture, arboriculture and care of stock. The Department of Horticulture and Botany was formed in 1892 with Robert H. Price as head, and the first degree in horticulture (a Master of Science) was awarded in 1898. Horticulture and Botany were separated in 1906, and the reorganized Horticulture Department was led by E. J. Kyle, namesake of Kyle Field, who later became Dean of Agriculture. Guy Adriance was appointed head of the Department of Horticulture circa 1920, and he served in that capacity until 1961. The Department of Horticulture during the Adriance era had its primary focus on fruit and vegetable crop production, horticultural food processing, and plant breeding for fruit and vegetable variety improvement.

The study of ornamental horticulture had its roots in the Department of Landscape Art which was organized and led by F. W. Hensel beginning in 1925. This department was reorganized to include the study of greenhouse crop production and floristry into the Department of Floriculture and Landscape Art in 1950 and the new unit was led by A. F. DeWerth. In 1961 the name of the department was changed to the Department of Floriculture.

In 1962, the horticulture departments (Horticulture and Floriculture) were merged with the Department of Agronomy and the resulting department was named Soil and Crop Sciences. Horticulture faculty retained their crop and commodity focus and they functioned somewhat like a section of the Soil and Crop Sciences Department. The very large increase in horticulture student enrollment that occurred in the early 1970s served as justification for the horticulture faculty, and their ardent supporters in the horticulture industry, to propose and to be granted the right to form their own department, the current Department of Horticultural Sciences, in 1976. The Horticulture/Forest Sciences Building in which the department resides today was completed in 1985.

The Department of Horticultural Sciences executes the tripartite mission of the landgrant university. Faculty who teach in the undergraduate and graduate programs are all physically located on the College Station campus. Faculty who conduct research and mentor graduate students and postdoctoral research associates are physically located on campus in College Station, or at off campus research centers in Weslaco, Uvalde, El Paso, Lubbock, Dallas, and Overton. Extension faculty are located in College Station, Weslaco, Uvalde, El Paso, Lubbock, Dallas, and Fredericksburg.

An Overview of the Major Horticultural Industry Sectors in Texas

The horticultural sectors in Texas are significant contributors to the State’s agricultural economy. Horticultural crops combined are the leading agricultural sector on the crop side and are only second to the livestock sector. Two broad segments comprise the horticultural industry including the green industry and the produce industry. Each is discussed separately in this overview.

The Green Industry Sector

The green industry complex is comprised of wholesale nursery, greenhouse, and turfgrass sod growers; landscape service firms such as architects, designers/builders, contractors, and maintenance firms; retail firms such as
garden centers, home centers and mass merchandisers with lawn and garden departments, and marketing intermediaries such as brokers and horticultural distribution centers (re-wholesalers). There is also a substantial allied trade industry that supplies various production inputs to the industry.

Total industry sales, including grower, landscaping and retailing sales increased 8.74% in 2011 for a total of $15.6 billion in gross sales. The grower sector experienced the highest increase in growth with almost 20% for a total of $1.9 billion, the highest sales level recorded for the grower sector. The landscaping sector had a slight increase of only about 3% in 2011 for total sales over $3.5 billion. With this slight increase sales of the landscaping sector are still below the highest levels of 2007 and 2008 with a peak of more than $3.9 billion. Gross retail sales increased 8.5% to a total of $10.1 billion in 2011.

Total economic contributions of the Green Industry in Texas were estimated at $17.97 billion in output; 200,303 jobs, and $10.7 billion in value added. For the production and manufacturing sectors, including nursery and greenhouse, lawn and garden equipment manufacturing, and metal building manufacturers, total output impacts were $3.7 billion; employment impacts were 32,195 jobs; and value added impacts were $1.7 billion. For the horticultural services sectors, including landscaping services and landscape architecture services, total output impacts were $7.6 billion; employment impacts were 88,824 jobs; and value added impacts were $4.1 billion. The largest economic impact contributions for individual sectors were landscaping services, lawn and garden stores and nursery and greenhouse.

We continue to see a number of structural changes occurring in the green industry. The shakeout that started with the Great Recession has slowed, but nonetheless continues at all levels of the supply chain. Several more reputable growers, landscape service providers, and retailers have gone out of business since last year. Not all of this productive capacity has exited the industry, however; consolidation activity through mergers and acquisitions continues to shrink the number of industry participants but some of the capacity is simply being operated under a different name. Hypercompetitive conditions have fostered a cost-centric mindset, as firms attempt to shave as many costs out of their value chain as possible.

The Produce Sector
In Texas, the number of acres for fresh market and processed vegetables was estimated to be 73,700 acres with a value of $361 million (NASS, USDA 2011) and an economic impact in excess of $450 million. Crops in that estimate include cabbage, cantaloupe, carrots, chili peppers, cucumbers, honeydew melons, spring onions, summer onions, spinach, squash, sweet corn, tomatoes, watermelon and snap beans. Not included in that estimate are bell peppers, lettuce, broccoli, okra, other leafy greens (mustard, collard, turnip, kale, etc.), herbs, and potatoes.

From regional focus workshops we have identified several economically important vegetable crops not included in the 2011 USDA statistics. Those are: 5,850 acres of specialty vegetables grown in the Wintergarden, Hill Country and Lower Rio Grande Valley (lettuce, tomato, beets, beet-tops, dandelion, parsley, cilantro, celery, Swiss Chard, collards, kale, kohlrabi, turnip greens, mustard greens, artichoke and habanero peppers) and 39,000 acres in the High Plains (30,000 dry beans, 7,000 southern peas, 2,000 pumpkin). Also not included in the USDA statistics are 14,040 acres of fresh market-processing potatoes (High Plains, Wintergarden and LRGV). Texas also grows 18,000 acres of grapefruit, 8,800 acres of oranges in the LRGV, 75,500 acres of improved pecan (3,000 in the Wintergarden and 12,500 in El Paso), 1,320 acres of peaches (Hill Country), 3,000 of grapes, and 35 acres of apples. Therefore the total combined area for growing vegetables, fruits, citrus, grapes and pecans was 238,745 acres in 2011. The gross value of pecan represented $80 million in 2011.

Fruit and vegetable production is scattered across the state. However, the four major vegetable producing regions of Texas are the Rio Grande Valley, the San Antonio-Wintergarden corridor, the Laredo-Eagle Pass region, the High Plains, West and East Texas. Other producing areas within the state include the Trans-Pecos, the Coastal Bend, and the North Texas area along the Red River. The leading vegetable producing counties in the State are: Hidalgo, Starr, Cameron, Deaf Smith, Frio, Uvalde, Zavala, Webb, Hale, Castro, Lamb, and Duval.

Historically, Texas ranked third in vegetable production behind California and Florida. Over the past decade, however, vegetable acreage has steadily declined to the point where Texas now ranks seventh in terms of volume
(3% of the U.S. total). The acreage decline is attributed to serious problems with insects, diseases, and drought conditions during this period in the Lower Rio Grande Valley, the state's major vegetable production region. Competition from imported sources has also increased in the last 10 years. Currently the share of consumption derived from imports is 25% for vegetables, compared with 8.3% in 1980 and 15.0% in 2000. On the fruit side, about 26% of the fruit consumed in the US was imported. That number increased to 42.4% in 2000 and to 48.8% in 2010. Mexico and other Latin American countries are causing a closing of market windows previously dominated by Texas. With respect to consumption, it is important to emphasize the new dietary guidelines established in 2010 with “My Plate” which involves half of the plate with fruits and vegetables. Therefore, the development of a strategic plan should address these trends in production factors, environmental limitations, marketing and nutritional health benefits of vegetable and fruits.

**Departmental Administrative Organization**

Horticultural Sciences is under the administrative leadership of a department head, and three associate heads are authorized for undergraduate, graduate, and extension programs. The associate head for undergraduate programs is currently vacant, and the department head is performing those duties. The relationships between the administrators and their support staff is illustrated below.

The Department of Horticultural Sciences is one of 14 academic departments in the College of Agriculture and Life Sciences, and the College represents the academic function of Texas A&M Agrilife (led by Vice Chancellor and Dean Mark Hussey). In addition to the College of Agriculture and Life Sciences (Alan Sams, Executive Associate Dean), Texas A&M Agrilife is composed of Texas A&M Agrilife Research (Craig Nessler, Director), Texas A&M Agrilife Extension (Doug Steele, Director), Texas A&M Forest Service (Tom Boggus, Director) and the Texas Veterinary Medical Diagnostic Laboratory (Tammy Beckam, Director).
Departmental Committees

Promotion and Tenure Committee
Tim Davis (Chair), all faculty with rank of full professor

Undergraduate Program and Curriculum Committee
Vacant (Chair), Astrid Volder, Leo Lombardini, Bill McKinley, Terri Starman, Greg Cobb

Graduate Program Committee
Mike Arnold (Chair), the Graduate Program Committee functions as a “committee of the whole;” all graduate faculty are members

Hort Farm Operations Advisory Committee
Dave Byrne (Chair), Joe Masabni, Mike Arnold, George McEachern, Creighton Miller

Greenhouse Operations Advisory Committee
Matt Kent (Chair), Mike Arnold, Dave Byrne, Terri Starman, Fred Davies, Bhimu Patil, Kevin Crosby

Departmental Assessment Committee
Dan Lineberger (Chair), Jayne Zajicek, Leo Lombardini, Mike Arnold, Greg Cobb, Astrid Volder, Katie Marek

Scholarship Committee
Vacant (Chair), Leo Lombardini, Bill McKinley, Creighton Miller, Dave Byrne, Trish Klein, Terri Starman

Departmental Building and Safety Committee
Matt Kent (Chair), Greg Cobb, Betsy Pierson

Departmental Vision and Mission Statement
The vision for faculty in Horticultural Sciences is that our department will be widely recognized for excellence in all our programs and as the best university horticulture department in the United States. This vision, taken from our departmental strategic plan (Appendix 6), aligns our faculty with the overall goal of the University as stated in the Vision 2020 statement to “enable our university to be recognized as one of the ten best universities in the nation by 2020 and as an invaluable resource to the state, nation and the world.” The goal of being recognized as a leader in our field is further amplified in the vision of the College of Agriculture and Life Sciences as it aspires to “be a world leader in agriculture, life and natural resource sciences and the many related disciplines they contain.” The atmosphere of striving for excellence and recognition is pervasive within our College and the University, and we are urged to assess honestly the programs that we provide and show quantifiable and steady progress toward our goals.

The Department of Horticultural Sciences exists to improve the quality of life through teaching, research, and extension programs related to the aesthetic disciplines of horticulture and the production of high quality, healthful fruits and vegetables. Our mission is accomplished by:

- educating students who seek careers in horticulture and related fields;
- developing and delivering research-based knowledge upon which efficient and profitable horticultural crop production can be built;
- improving the competitive position of the Texas horticulture industry;
- increasing the quality, variety, and availability of horticultural products;
- developing and delivering research-based knowledge related to how horticulture improves our environment and serves as a source of personal enrichment.
Overview of Departmental Facilities
The Department of Horticultural Sciences is located in the Horticulture/Forest Science Building (HFSB). The 90,000 square foot building boasts a beautiful atrium, the Benz Gallery of Floral Art, modern research and teaching laboratories with the latest scientific equipment, and a small growth chamber complex. Greenhouse space, totaling 38,000 square feet, is conveniently located behind the building. Adjacent to the building is the Holistic Garden, a space used for educational as well as recreational purposes. The Holistic Garden is in a stage of transition and will support the increasing emphasis in student experiential learning as it becomes the primary growing area of the Howdy! Farm.

In addition to its central location in HFSB, the department manages facilities at several other locations. The Vegetable and Fruit Improvement Center, located in the Centeq Building in the TAMU Research Park, occupies 7,367 sq. ft. of office and lab space, with labs designed for identification and quantification of phytochemicals, plant tissue culture, and plant molecular biology. One of the labs in the Institute for Plant Genomics & Biotechnology (Borlaug Center) is assigned to a faculty member in Horticultural Sciences. Greenhouse, shade area, and test plots for nursery crops are located in Hensel Park, and the Floriculture Greenhouses located in the central campus area are student-managed, student-maintained facilities that house collections of tropical foliage plants used in the teaching programs of the department and in the Department of Biology. The department is moving the location of the horticulture farm from its current location northwest of HFSB to an area on the former dairy farm off Harvey Mitchell Parkway (FM2818).

Previous External Review and Discussion of Implications
The most recent academic program review was conducted in May, 2005 and consistent with the charge to the review team by then Dean of Graduate Studies John R. Giardino to “examine the doctoral programs with the Department of Horticultural Sciences” that evaluation included only an evaluation of the Ph. D. in Horticulture. Topics related to all graduate degrees (graduate assistantships, recruitment, facilities, faculty capability, etc.) necessarily were part of the review, but clearly the focus was on doctoral programs.

The major decisions associated with specific issues raised in the final report from the review committee were:

- The department adopted a more effective program for dealing with safety training of graduate students.
- Graduate assistantship funding was evaluated to be not competitive with the national trend in our discipline and the department increased the annual amounts from $14,000 (Masters) and $15,000 (Ph.D.) to $16,000 (Masters) and $17,000 (Ph.D).
- Departmental teaching assistantships were “uncoupled” from the faculty who teach high-enrollment, multiple-section courses in an attempt to recruit the most qualified graduate students and pair them with faculty who share their research interests. Assistantships would be assigned for one year, but would be renewable depending on satisfactory progress.
- An effort was made to increase the number of graduate level courses in the department through the offering of several one credit hour mini-courses.
- The uncertainty surrounding the location of the horticulture farm was deemed to be a weakness affecting several programs.
In later sections of this self-study, consideration will be given to the extent to which the department has made progress on these recommendations. Several new graduate level courses have been added (some have been discontinued), the policy of “uncoupling” assistantship funding from high-enrollment courses has proven to be problematic (not all entering students have the background or interest to teach plant identification or floral design, for example), and any progress we have made in increasing assistantship stipends has been eroded by cost of living increases and static funding for assistantships. While the location of the “new” horticulture farm has been decided, funding for development of the property has not been adequate to replace all facilities at the current location on west campus, so the transition has not been completed.
2. OVERVIEW OF UNDERGRADUATE PROGRAMS

The Department of Horticultural Sciences offers two baccalaureate degrees, a Bachelors of Science in horticulture (BS) and a Bachelor of Arts in horticulture (BA). The BS is designed to meet the needs of students who are pursuing careers in a wide array of horticultural fields including fruit and vegetable crop production, landscape management, horticultural sales, greenhouse operations, science and biotechnology, and other pursuits typically associated with the discipline. Students who intend to pursue a graduate degree also are advised into the BS program. The Bachelor of Arts degree promotes a foundation in the arts, business, communication and language and is designed for students who intend careers in floral design, event planning, public horticulture, sociohorticulture, garden writing, or secondary education.

Student Learning Outcomes of the Bachelors Degrees in Horticulture

The Bachelor of Science in Horticulture graduate is expected to demonstrate a fundamental understanding of the theoretical and practical aspects of horticulture. When students graduate from Texas A&M University with a BS in Horticulture, they should possess a thorough understanding of the principles of plant growth and development, and a specific grasp of how these principles impact their particular specialization or commodity area. Ancillary knowledge of other disciplines including genetics, entomology, plant pathology, soil science, plant physiology and landscape management should also be demonstrated. Specific outcomes of the program are:

- Graduates will demonstrate core science-based horticultural knowledge in the areas of plant growth, development, propagation, and culture.
- Graduates will demonstrate their ability to communicate core horticultural knowledge orally and in writing.
- Graduates will demonstrate competency in using electronic technology (e.g. computer, software).
- Graduates will demonstrate their critical-thinking ability in using core horticultural knowledge to diagnose and solve practical horticultural problems.
- Graduates will become responsible citizens of their respective communities and exhibit leadership skills, interest in life-long learning, an appreciation for cultural diversity, and have tolerance for different beliefs and perspectives. Our graduates will demonstrate a high level of professionalism and ethical behavior.
- Students will gain experience in working as a member of a team in the process of completing class exercises, designs, projects and extracurricular activities.
- Students will be exposed to the importance of continuing their education and skills development and the role it has in their professional growth.
- Graduates will demonstrate an awareness of the global dimensions of horticulture and the impact that internationalization plays in the US horticultural enterprise.

The Bachelor of Arts in Horticulture graduate should demonstrate a sound grasp of the principles of the basic plant sciences, achieve both practical and fundamental mastery of horticultural science, and possess strength in the fundamentals of the student’s selected minor. The defining element of the Bachelor of Arts degree is that, in addition to the elements in common with the Bachelor of Science, when students graduate from Texas A&M University with a BA in Horticulture, they should demonstrate an appreciation and mastery of the basic principles related to business, the arts and/or the human association with plants depending on their area of emphasis. Possible areas of interest include floral design, the installation and management of public gardens, business, and horticultural education. The specific outcomes of the BA are identical to the BS with the addition of the following:

- Graduates will demonstrate an understanding of how plants impact people, including an awareness of the social, cultural, aesthetic and functional uses of landscape and floral designs.

The Bachelor of Arts (BA) degree was approved in 2007 to meet the needs of students pursuing careers in the art or humanistic dimensions of horticulture. Upon graduation, these students may enter the fields of floral design or event planning, public gardens management or education, sociohorticulture, or landscape design. With the design and implementation of the BA program, the faculty recognized that the educational background and skills required of the “art” dimension of horticulture are different than the “science” dimension, and these differences are reflected in the program requirements.
The two degrees share many common elements including the entire required horticulture core courses, most of the university core, and some of the supporting field courses. BA students do not usually take soil science, genetics, plant physiology, or organic chemistry, but are required to take two additional courses in foreign language and must specify a minor or the Professional Event Management Certificate.

**Table 2.1 Curricular requirements by categories of the Bachelor of Science and Bachelor of Arts in Horticulture degrees.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Bachelor of Science</th>
<th>Bachelor of Arts</th>
</tr>
</thead>
<tbody>
<tr>
<td>University core</td>
<td>43 hrs communication elective</td>
<td>43 hrs public speaking specified</td>
</tr>
<tr>
<td>Horticulture core</td>
<td>9 hrs</td>
<td>9 hrs</td>
</tr>
<tr>
<td>Support courses-required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entomology, Plant Path</td>
<td>20 hrs</td>
<td>16 hrs foreign language (2), technical writing</td>
</tr>
<tr>
<td>Horticulture specialization</td>
<td>18 hrs</td>
<td>18 hrs urban horticulture, floral design, landscape design</td>
</tr>
<tr>
<td>requirements</td>
<td>Fruit &amp; vegetable, nursery/floral crops, landscape management, science &amp; biotech</td>
<td></td>
</tr>
<tr>
<td>Support courses-directed</td>
<td>30 hrs</td>
<td></td>
</tr>
<tr>
<td>electives</td>
<td>Typically production-based, agronomy, business, ag eng, ento, plant path, etc.</td>
<td>34 hrs specified minor (15-18 hrs), or PEM Certificate; minors include business, social sciences, communications, education</td>
</tr>
<tr>
<td>Free electives</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total semester hours</td>
<td>120</td>
<td>120</td>
</tr>
</tbody>
</table>

**Curriculum in Horticulture - Bachelor of Arts**

This degree blends traditional horticulture with the benefits derived from the human association with plants. This degree offers students the option of pairing a horticulture degree with electives in social sciences, business, education, art and design. Creative opportunities range from planning gala events, to designing tranquil gardens, to constructing educational programs for school gardens to pursuing advanced degrees. Graduates may find themselves working in exciting environments including botanical gardens, international flower markets or upscale resorts.

**UNIVERSITY CORE CURRICULUM**

<table>
<thead>
<tr>
<th>Required course</th>
<th>(Th-Pr)</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 101 Botany</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>BIOL 111 Introductory Biology I</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 101 and 111 Fundamentals of Chemistry I and Lab.</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>COMM 203 Public Speaking</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 104 Composition and Rhetoric</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>POLS 206 American National Government</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>POLS 207 State and Local Government</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>History electives</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Humanities elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Mathematics electives</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Social and behavioral sciences elective</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
**Visual and performing arts elective¹**

* KINE 198 Health and Fitness Activity  
  (0-2)  
  1

* KINE 199 Required Physical Activity  
  (0-2)  
  1

---

### HORTICULTURAL SCIENCES CORE COURSES

<table>
<thead>
<tr>
<th>Required course</th>
<th>(Th-Pr)</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 101 Concepts of Horticultural Science</td>
<td>(1-0)</td>
<td>1</td>
</tr>
<tr>
<td>HORT 201 General Horticulture</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>HORT 202 General Horticulture Laboratory</td>
<td>(0-3)</td>
<td>1</td>
</tr>
<tr>
<td>HORT 326 Plant Propagation</td>
<td>(2-3)</td>
<td>3</td>
</tr>
<tr>
<td>HORT 481 Seminar</td>
<td>(1-0)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total** 43

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### SUPPORT COURSES

<table>
<thead>
<tr>
<th>Required course</th>
<th>(Th-Pr)</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTO 201 General Entomology</td>
<td>(2-2)</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 210 Scientific and Technical Writing or ENGL 301 Technical Writing</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>PLPA 301 Plant Pathology</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>PLPA 303 Plant Pathology Laboratory</td>
<td>(0-2)</td>
<td>1</td>
</tr>
<tr>
<td>Language²</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Directed horticulture electives³</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Directed electives⁴</td>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>

**Total** 68

---

**NOTES:**

1. To be selected from the University Core Curriculum.
2. Student must successfully complete a two-course sequence of a foreign language.
3. Hours to be selected based on the emphasis area chosen in consultation with the student’s academic advisor.
4. Hours to be selected with approval by the student’s academic advisor and the associate department head from 100–400-level courses in:
   - ACCT, AGCJ, AGEC, AGLS, SCSC, ALEC, ANTH, ARTS, BESC, COMM, ECON, ENDS, ENTO, EPSY, FINC, FRSC, GENE, GEOG, HLTH, HORT, INFO, INST, KINE, LAND, MEPS, MKTG, MKTG, NUTR, PSYC, RENR, RLEM, RPTS, SAED, SEFB, SOCI, SPAN, SPED, STAT, WFSC. No more than 15 hours can be used from HORT.

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### Curriculum in Horticulture - Bachelor of Science

This degree is designed to provide students with the knowledge and skills needed for production, management and marketing of horticultural and floriculture crops. Each degree also offers students with strong interests in science and/or technology opportunities in research related fields including graduate studies. Career prospects range from producing specialty herb crops for upscale restaurants, to managing landscape businesses for growing communities, to marketing fruits and vegetables for healthier lifestyles. Many former students are self-employed, owning their own greenhouse, nursery or landscape operation. Others work in upper management of large corporations or travel the world developing future horticultural crops.

---

### UNIVERSITY CORE CURRICULUM

<table>
<thead>
<tr>
<th>Required courses</th>
<th>(Th-Pr)</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 101 Botany</td>
<td>(3-3)</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 111 Introductory Biology I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 101 and 111 Fundamentals of Chemistry I and Lab.</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 104 Composition and Rhetoric</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>POLS 206 American National Government</td>
<td>(3-0)</td>
<td>3</td>
</tr>
</tbody>
</table>
POLS 207 State and Local Government (3-0) 3
Communication elective 1 3
History electives 1 6
Humanities elective 1 3
Mathematics electives 1 6
Social and behavioral sciences elective 1 3
Visual and performing arts elective 1 3
* KINE 198 Health and Fitness Activity (0-2) 1
* KINE 199 Required Physical Activity (0-2) 1

**HORTICULTURAL SCIENCES CORE COURSES**

<table>
<thead>
<tr>
<th>Required course</th>
<th>(Th-Pr)</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 101 Concepts of Horticultural Science</td>
<td>(1-0)</td>
<td>1</td>
</tr>
<tr>
<td>HORT 201 General Horticulture</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>HORT 202 General Horticulture Laboratory</td>
<td>(0-3)</td>
<td>1</td>
</tr>
<tr>
<td>HORT 326 Plant Propagation</td>
<td>(2-3)</td>
<td>3</td>
</tr>
<tr>
<td>HORT 481 Seminar</td>
<td>(1-0)</td>
<td>1</td>
</tr>
</tbody>
</table>

9

**SUPPORT COURSES**

<table>
<thead>
<tr>
<th>Required course</th>
<th>(Th-Pr)</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 222 Elements of Organic and Biological Chemistry</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENTO 201 General Entomology</td>
<td>(2-2)</td>
<td>3</td>
</tr>
<tr>
<td>GENE 310 Principles of Heredity or GENE 315 Genetics of Plants</td>
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<td>3</td>
</tr>
<tr>
<td>GENE 320 Biomedical Genetics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEPS 313 Introduction to Plant Physiology</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>PLPA 301 Plant Pathology</td>
<td>(3-0)</td>
<td>3</td>
</tr>
<tr>
<td>PLPA 303 Plant Pathology Laboratory</td>
<td>(0-2)</td>
<td>1</td>
</tr>
<tr>
<td>SCSC 301 Soil Science</td>
<td>(3-2)</td>
<td>4</td>
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<td>Directed horticulture electives 2</td>
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<tr>
<td>Directed electives 3</td>
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<td>30</td>
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</tbody>
</table>

68

**NOTES:**

4. To be selected from the University Core Curriculum.

5. Hours to be selected based on the emphasis area chosen in consultation with the student’s academic advisor. Hours to be selected with approval by the student’s academic advisor and the associate department head from 100–400-level courses in: ACCT, AGEC, SCSC, AGSM, ALEC, BESC, BICH, BIOL, CHEM, COSC, ECON, ENTO, FINC, FRSC, GENE, HLTH, HORT, INST, JOUR, LAND, MEPS, MGMT, MKTG, NUTR, PHYS, PLPA, RENR, RLEM, RPTS, SPAN, STAT, WFSC. No more than 15 hours can be used from HORT.

**Horticultural Specializations**

The concept of “horticultural specializations” is used as an advising tool to further delineate the undergraduate degree programs into tracks that help students begin to focus their career interests. The BA program currently has 3 specializations (floral design/event planning, landscape design, and urban horticulture) (Table 2.2, Appendix 2.1). The horticultural therapy track in the BA was discontinued 2 years ago because of loss of a faculty member critical to that area. The low numbers of students expressing an interest in hortitherapy did not justify continuing this option. The BS program has 4 tracks (nursery/floral production, landscape management, fruit and vegetable production, and science and biotechnology) (Table 2.2, Appendix 2.2).
Specializations within the BA degree are predominantly in floral design/event planning or landscape design. The number of students in floral design/event planning has more than doubled since 2007; the number of students tracking in landscape design have likewise increased dramatically, and the overall enrollment in the BA program now outnumbers the BS program. A concomitant decrease in the enrollment in the BS landscape management program accompanied the dramatic increase in students electing the BA landscape design specialization (Table 2.2).

<table>
<thead>
<tr>
<th>Bachelor of Arts</th>
<th>Floral design</th>
<th>Land design</th>
<th>Urban</th>
<th>Hort therapy</th>
<th>TOTAL BA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007C</td>
<td>21</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td>2008A</td>
<td>20</td>
<td>16</td>
<td>3</td>
<td>0</td>
<td>39</td>
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<tr>
<td>2008C</td>
<td>35</td>
<td>27</td>
<td>9</td>
<td>0</td>
<td>71</td>
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<tr>
<td>2009A</td>
<td>32</td>
<td>31</td>
<td>9</td>
<td>1</td>
<td>73</td>
</tr>
<tr>
<td>2009C</td>
<td>26</td>
<td>27</td>
<td>7</td>
<td>1</td>
<td>61</td>
</tr>
<tr>
<td>2010A</td>
<td>29</td>
<td>25</td>
<td>7</td>
<td>1</td>
<td>62</td>
</tr>
<tr>
<td>2010C</td>
<td>30</td>
<td>23</td>
<td>8</td>
<td>1</td>
<td>62</td>
</tr>
<tr>
<td>2011A</td>
<td>40</td>
<td>21</td>
<td>10</td>
<td>2</td>
<td>73</td>
</tr>
<tr>
<td>2011C</td>
<td>55</td>
<td>26</td>
<td>9</td>
<td>1</td>
<td>91</td>
</tr>
<tr>
<td>2012A</td>
<td>54</td>
<td>22</td>
<td>5</td>
<td>1</td>
<td>82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bachelor of Science</th>
<th>Nursery/floral</th>
<th>Landscape Mgmt</th>
<th>Fruit/Veg</th>
<th>Science/biotech</th>
<th>TOTAL BS</th>
<th>Undecided</th>
<th>*Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007C</td>
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<td>32</td>
<td>7</td>
<td>6</td>
<td>62</td>
<td>59</td>
<td>153</td>
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<tr>
<td>2008A</td>
<td>16</td>
<td>19</td>
<td>5</td>
<td>5</td>
<td>45</td>
<td>80</td>
<td>164</td>
</tr>
<tr>
<td>2008C</td>
<td>22</td>
<td>25</td>
<td>9</td>
<td>13</td>
<td>69</td>
<td>24</td>
<td>164</td>
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<tr>
<td>2009A</td>
<td>17</td>
<td>13</td>
<td>12</td>
<td>13</td>
<td>55</td>
<td>37</td>
<td>165</td>
</tr>
<tr>
<td>2009C</td>
<td>17</td>
<td>17</td>
<td>10</td>
<td>9</td>
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<td>2010A</td>
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<td>51</td>
<td>165</td>
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<tr>
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<td>13</td>
<td>14</td>
<td>7</td>
<td>54</td>
<td>67</td>
<td>183</td>
</tr>
<tr>
<td>2011A</td>
<td>22</td>
<td>18</td>
<td>21</td>
<td>9</td>
<td>70</td>
<td>49</td>
<td>192</td>
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<tr>
<td>2011C</td>
<td>21</td>
<td>17</td>
<td>23</td>
<td>12</td>
<td>73</td>
<td>26</td>
<td>190</td>
</tr>
<tr>
<td>2012A</td>
<td>19</td>
<td>15</td>
<td>21</td>
<td>14</td>
<td>69</td>
<td>40</td>
<td>191</td>
</tr>
</tbody>
</table>

*Total derived from departmental records; slightly higher that the official university number from DARS, as our total includes students who are double majors or are pursuing two degrees.

**Undergraduate Course Offerings**

Faculty in Horticultural Sciences offer a diverse and comprehensive array of basic and advanced courses in horticulture including such specialties as floral design, ornamental plant identification, viticulture and enology, fruit and vegetable production, plant breeding, and nut culture. Several of our courses meet the requirements of the various university core areas including HORT 201 (science core), HORT 203 (humanities and performing arts cores), HORT 225 and 315 (writing intensive courses), and HORT 481 (communication intensive course).
101. **Concepts of Horticultural Science.** (1-0). Credit 1. Introduction to the many facets of horticulture in Texas and the United States including organization, history and nature of the industry; discussion of professional development and identification of career opportunities.

201. **Horticultural Science and Practices.** (3-0). Credit 3. Structure, growth and development of horticultural plants from a practical and scientific approach; environmental effects, basic principles of propagation, greenhouse and outdoor production, nutrition, pruning and chemical control of growth, pest control and branches of horticulture. (Transfer equivalents AGRI 1315, 1415, 1301, 1401)

202. **Horticultural Science and Practices Laboratory.** (0-3). Credit 1. Methods and practices related to production of horticultural crops; practical exercises in greenhouse and field. Prerequisite: HORT 201 or registration therein.

203. **Floral Design.** (2-2). Credit 3. Principles of design illustrated with the use of floral materials; floral design elements and techniques including color, form, line and texture; history and utilization of floral art in society.

223. **Flower Quality Standards.** (0-2). Credit 1. Judging quality standards for flowers and potted plants for retail flower shops. Intercollegiate flower judging team chosen from this class.*Course Descriptions/Horticultural Sciences 699

225. **Horticulture Learning Community.** (1-0). Credit 1. Understanding the personal and professional competencies that should develop during college career; determine learning style; develop oral and written communication skills, teamwork and leadership characteristics, analytical and critical thinking, research and problem solving skills; exposure to current critical issues in horticulture and science. Prerequisite: Horticulture or floriculture major.*

291. **Research.** Credit 1 to 3. Research conducted under the direction of faculty member in horticulture. May be repeated 2 times for credit. Prerequisites: Freshman or sophomore classification and approval of instructor.

301. **Garden Science.** (3-0). Credit 3. Identification, propagation, soil management, fertilization, growth control and protection of common garden plants: indoor ornamentals, landscape ornamentals, fruits and vegetables; special topics include home landscaping, container gardens, bonsai, herbs and medicinal plants and hobby greenhouse management. The effects of organic and non-organic practices on the garden ecosystem.


306. **Woody Ornamental Plants.** (2-2). Credit 3. Better known woody ornamental trees and shrubs; identification, morphology, classification, nomenclature and adaptability for use in landscape environments. Prerequisite: BIOL 101 or HORT 201 or approval of instructor.

308. **Landscape Plant Materials.** (2-2). Credit 3. Identification and use of indigenous and introduced landscape plants; plants for special uses in urban environments; emphasis on plants’ ornamental attributes, cultural requirements, and adaptability in urban and suburban environments. Prerequisite: HORT 201 or HORT 306 or BIOL 101 or approval of instructor.

309. **Interior Plants.** (2-2). Credit 3. Identification, selection and maintenance of interior foliage plants; emphasis on design solutions for commercial and private facilities. Prerequisites: HORT 201; junior or senior classification.

311. **Principles of Food Processing.** (2-3). Credit 3. Principles and practices of canning, freezing, dehydration, pickling and specialty food manufacture; fundamental concepts of various techniques of preparation, processing, packaging and use of additives; processing plants visited. Cross-listed with FSTC 311.

315. **Issues in Horticulture.** (3-0). Credit 3. Analysis of contemporary economic, technological, environmental, human resource, and regulatory issues that impact the way global horticultural firms compete; emphasis on problem recognition and analysis of managerial decisions by firms throughout the entire horticultural supply chain. Prerequisites: HORT 201 and HORT 202.

319. **Fruit and Nut Production.** (2-3). Credit 3. Rootstocks, cultivars, identification, site selection, pollination,
pruning, fruit thinning, dormancy, orchard culture management, irrigation, pest control, harvesting and post harvest physiology of temperate fruit and nut species. Prerequisite: HORT 201.*

325. **Vegetable Crop Production. (2-3). Credit 3.** Origin, nutritive value, economic importance, botany and cultural practices of the major vegetable crops. Lab activities include organic and non-organic production of major vegetable crops.

326. **Plant Propagation. (2-3). Credit 3.** Principles, practices and techniques followed in the sexual and asexual propagation of horticultural plants: seed technology and seed propagation, rooting and propagation of cuttings, graftage and budding systems, layering and propagation by specialized plant structures, biotechnology and tissue culture systems for micropropagation.

332. **Horticulture Landscape Graphics. (1-2).** Credit 2. Graphic representation of landscape design; demonstrations of technique; examination of drawing examples and drawing production; basic hand graphics techniques for visual-thinking and presentation-quality landscape drawings. Prerequisite: Junior or senior classification.

335. **Sociohorticulture. (3-0). Credit 3.** Horticulture as a therapeutic medium for special populations; use of horticulture in urban development and community garden programs. Prerequisite: Junior classification.

400. **Field Studies in Horticulture. Credit 1 to 3.** Field trip to observe operation of horticultural businesses, governmental agencies affecting horticultural programs, and public and private institutions active in horticulture in the U.S. and other countries; usually arranged during spring break, between semesters or during the summer; may be repeated for credit. Prerequisites: HORT 201 or HORT 301 and approval of instructor.*

404. **Plant Breeding. (2-2). Credit 3.** Application of genetics and other sciences to breeding and improvement of horticultural crops; methods and special techniques employed. Offered in even numbered years. Prerequisite: GENE 301. Cross-listed with GENE 404. Credit cannot be given for both HORT 404 and SCSC 304.*

418. **Nut Culture. (3-0). Credit 3.** Orchard management, native grove development, cultivars, fruit setting, soils, nutrition, propagation, pest control, harvesting, shelling, storage and marketing of temperate tree nut crops grown in the U.S. with major emphasis on pecans. Offered in odd numbered years. Prerequisite: HORT 319 or approval of instructor.

419. **Viticulture and Small Fruit Culture. (3-0). Credit 3.** Classic winegrape culture in Europe and U.S. are taught; influence of climate, soil, cultivar, rootstock, canopy and management is presented; nutrition, water, spacing, trellis, pruning, IPM and harvest are integrated for quality yields; culture of muscadines, berries, figs and persimmons are taught. Offered in even numbered years. Prerequisite: HORT 319 or approval of instructor.

420. **Concepts of Wine Production. (3-0). Credit 3.** Classic wine grapes of the world and where they are produced; evaluation of wine style and quality through formal laboratory tastings. Prerequisites: HORT 201, HORT 319, HORT 419 or HORT 446 or FSTC 201; must be 21 years of age; junior or senior classification.

421. **Enology. (2-3). Credit 3.** Provides a basic understanding of each step of the wine making process; emphasis on home and small scale commercial wine production as related to Texas conditions. Prerequisites: Must be 21 years of age; junior or senior classification.*

422. **Citrus and Subtropical Fruits. (3-0). Credit 3.** Various types of citrus: identification, culture, processing, marketing, and economic future; prepares students to function in a continuously changing production environment in production areas. Offered in even numbered years. Prerequisite: Approval of instructor.*

423. **Tropical Horticulture. (3-0). Credit 3.** Production, processing and marketing of coffee, bananas, cacao, mango, cashew, pineapple, coconut and root and tuber crops; recent significant developments in plant breeding and cultural practices. Offered in odd numbered years. Prerequisites: HORT 201 or approval of instructor.

425. **Landscape Maintenance and Construction. (2-3). Credit 3.** Principles and practices of grading, drainage and construction of residential and small commercial landscapes; cost and bid estimation; soil preparation; transplanting operations; control of landscape diseases and pests; maintenance of landscape
areas. Prerequisite: HORT 201 or approval of instructor.

426. **International Floriculture Marketing. (2-2). Credit 3.** Importance, cost, and opportunities in marketing floral products, fresh cut flowers, flowering potted plants, foliage plants, and bedding/garden plants; topics include: world production areas, economic value, species grown, marketing channels, retail environments, current/future consumers, postharvest handling, promotion/advertising, perceived/added value, marketing trends and employment opportunities. Prerequisites: HORT 201; junior or senior classification.

427. **Fall Greenhouse Crops. (0-2). Credit 1.** Hands-on lab for growing and managing fall greenhouse crops including fall bedding plants, cut flowers, foliage, poinsettias and other flowering potted plants.

428. **Greenhouse Operation and Management. (2-2). Credit 3.** Principles of greenhouse operation and management for production of horticultural crops; construction and operation of greenhouse structures and systems; regulating and controlling the environment and applying cultural practices as they affect plant physiological processes and influence plant growth and development; management of a greenhouse business. Prerequisite: HORT 201.*

429. **Floriculture Crop Production. (2-2). Credit 3.** Production of floriculture crops in the greenhouse environment; scheduling and controlling crop growth for target market periods; specific flowering crops will be used as models to demonstrate potted flowering plant, cut flower, and garden plant production systems; hands-on crop production experience in lab. Prerequisite: HORT 201.*

430. **Nursery Production and Management. (2-2). Credit 3.** Container, field and protected culture production of ornamental nursery plants (shrubs, trees, ground covers, bedding plants and herbaceous perennials); retail and wholesale nursery-site selection and development, financing, niche-marketing, personnel and labor management; wholesale nursery production cycles and systems, storage and shipping.*

431. **Horticulture Landscape Design. (2-2).** Credit 3. Application of the principles and elements of design to planning and developing both exterior residential landscape designs and interior commercial designs. Prerequisites: HORT 203; HORT 332; HORT 306 or HORT 308 or approval of instructor.

432. **Urban Horticulture. (3-0). Credit 3.** Introduction to urban horticulture and its role in community development and well-being; emphasis on career opportunities and the roles of the urban horticulture programmer. Offered in odd numbered years. Prerequisite: Junior or senior classification.

433. **International Horticulture. (3-0). Credit 3.** Examines the source of horticultural commodities; shows how geography, culture, politics, and history influence our markets, gardens and refrigerators; educates students on interpreting different garden styles; offered in even number years. Prerequisite: Junior or senior classification.

434. **Horticulture Landscape Design II. (2-2). Credit 3.** Introduce computer-aided-drafting (CAD) to produce site layout, grading and planting plan, and construction details for small-scale landscape design; advanced design principles and practices in their historical context, includes design and drafting of hardscape details, manipulation of earth forms, ecological urban park design to traditional garden design. Prerequisites: HORT 203, HORT 308 and HORT 432 or approval of instructor; junior or senior classification.

435. **Horticultural Therapy. (2-3). Credit 3.** Principles and practices of horticultural therapy; planning and implementing horticultural programs for persons with special needs. Offered in odd numbered years. Prerequisites: HORT 335 or HORT 435 or approval of instructor; junior or senior classification.

436. **Commercial Fruit and Vegetable Processing. (2-3). Credit 3.** Pilot plant and laboratory operations pertaining to processed fruits, vegetables and beverages; new product development emphasized via individual laboratory projects. Offered in even numbered years. Prerequisite: FSTC 311. Cross-listed with FSTC 446.

437. **Retail Floristry. (2-3). Credit 3.** Principles of floral design in a commercial shop enterprise; aspects of design in vase arrangements, personal flowers, sympathy flowers and flowers for special occasions; production costs and profit analysis, selling techniques and customer relations; term project required. Prerequisite: HORT 203 or approval of instructor.

438. **Floral Design: Weddings and Personal Flowers. (2-3). Credit 3.** Basic principles of floral design as applied to wedding work; design principles and mechanics as applied to corsages, headpieces, hand
bouquets and ceremony and reception decorations; history of wedding traditions; selling and pricing
weddings. Prerequisite: HORT 203 or HORT 451 or approval of instructor.

453. **Floral Art. (1-2). Credit 2.** Advanced study of floral design as an art form in contrast to a commercial
florist operation; interpretive expression of design principles and color stressed along with international
design styles. Prerequisites: HORT 203; HORT 451 and/or HORT 452.

454. **Special Event Design and Production. (1-2). Credit 2.** Role of event planners, production managers,
designers, and decorators within traditional event management practices; analyze how artistic components
are used in visual styling to achieve a specific purpose; impact of collaborative planning, effective research,
and strong communication skills, social psychological and economic influences as they relate to event
planning. Prerequisite: Junior or senior classification.

481. **Seminar. (1-0). Credit 1.** Review of current research literature in field of horticulture presented by senior
students; transition from college to work environment, including professional development and career
advancement; required of all senior students in horticulture.

484. **Internship. Credit 1 to 4.** On-the-job experience program in the student’s area of horticultural special-
ization. Must be taken satisfactory/unsatisfactory. May be taken three times. Prerequisites: Sophomore,
junior or senior classification; approval of instructor; 2.0 GPR in major and overall.

485. **Directed Studies. Credit 1 to 4.** Special problems and projects in any area of horticulture. Prerequisite:
Junior or senior classification or approval of department head.

489. **Special Topics in... Credit 1 to 4.** Selected topics in an identified area of horticultural science. May be
repeated for credit. Prerequisite: Approval of instructor.*

491. **Research. Credit 1 to 3.** Research conducted under the direction of faculty member in horticulture. May
be repeated 2 times for credit. Registration in multiple sections of this course are possible within a given
semester provided that the per semester credit hour limit is not exceeded. Prerequisites: Junior or senior
classification and approval of instructor.

NOTE: Undergraduate floriculture courses are taught under the horticulture designation.
*Field trips required for which departmental fees may be assessed to cover costs.

**High Impact Practices – Experiential Learning**
Texas A&M University is committed to providing high-impact learning experiences to all students at all levels,
across the whole curriculum. Also known as experiential learning, the concept can be defined as learning that
takes place when students are actively engaged in the educational process, when their learning goes beyond the
classroom to be applied in their lives. In a high-impact learning experience, students actively pose and solve
problems, work collaboratively in a community of peers, experience real-world applications of knowledge, and
reflect on their learning processes. (http://us.tamu.edu/Students/High-Impact-Practices/High-Impact-Practices-
Defined )

In 2011, the Department of Horticultural Sciences began promoting high impact practices in earnest.
Departments in the College of Agriculture and Life Sciences were asked to write proposals toward the goal of
having 100% of our undergraduate population complete a high impact learning experience by the year 2015 (in a
program named Activity 2015).

Drawing from historical student participation and focusing on desired future learning outcomes for the
undergraduate student population, the Department decided to center its efforts on three primary experiential
learning activities: internships, study abroad/international experiences, and undergraduate research, while
allowing for other significant experiences to be included as well. Target ranges for participation in activity types
are as follows:

- **Internships** – 50%-60% of all Horticulture majors;
- **Study Abroad/International Experience** – 20%-25% of all Horticulture majors;
- **Undergraduate Research/Directed Studies** – 15-20% of all Horticulture majors; and
- **Other high-impact experiences** – 5-15% of all Horticulture majors.
Other high impact experiences may include service learning, honors coursework, and significant/measurable participation with a university club or organization.

Funding from the Activity 2015 grant was used to hire a half-time experiential learning coordinator, provide funds to support faculty travel to facilitate international programs and studies abroad, and provide small grants to help faculty defray the cost of supplies associated with mentoring student researchers in their labs.

With no official requirement built-in to the curriculum, the Department focuses on presenting appealing high impact learning opportunities drawn from a wide range of sources and encouraging students to take the initiative to participate in one or more of them in the course of their undergraduate studies. The departmental Website (http://hortsciences.tamu.edu) features opportunities prominently as does the student news and events blog created for this purpose (http://whatsupaggiehort.blogspot.com/). Advisor newsletters and departmental bulletin boards are also employed in the interest of reaching the greatest number of students.

**Results**

A single year has passed since the Department of Horticultural Sciences began its coordinated efforts at increasing student participation in high impact areas. Year 1 results showed an increase in the number of students participating in an internship or study abroad program above historical levels. However, additional years’ reporting will help us determine if our outreach and promotion efforts are consistently increasing student participation.

**Figure 2.1 Historical trend in horticulture student participation in study abroad/international experience and for credit internship programs (HORT 484).**

Studies abroad and HORT 484 internships have increased markedly during the first year of the grant.

In addition to the emphasis on studies abroad and internships, we have begun to formalize and quantify participation in other experiential learning activities, most notably, participation in the on-campus,
student-run vegetable crop production enterprise, the Howdy! Farm.

**Study Abroad**
Two faculty-led study abroad programs are available in the Department of Horticultural Sciences including *International Horticulture in Italy* led by Dr. Leo Lombardini and *Season Extension Horticulture in China* led by Dr. Mengmeng Gu.

**Undergraduate Research and Directed Studies**
Several opportunities exist for students to gain high impact experience under the tutelage of departmental faculty. Dr. Astrid Volder offers HORT 485 credit for students interested in working on the TAMU Green Roof project. Dr. Koiwa, Dr. Arnold, Dr. Byrne, Dr. Lombardini, Dr. Starman, and Dr. Patil have each offered undergraduates the opportunity for undergraduate research experience and/or directed studies. However, no central system currently exists to direct students into programs and not all faculty members offer such opportunities each semester, leaving room for improvement to facilitate connections between interested students and available faculty in these areas.

**Honors Coursework**
Currently, Dr. Patricia Klein offers an honors version of HORT 201, but the course does not always make. Due to low participation, the 201H option will likely be discontinued. Horticulture majors are able to participate in honors coursework in other departments.

**Service Learning**
While not officially sanctioned by the University as a service-learning course, Dr. Jayne Zajicek offers opportunities and incentives for students in HORT 335 (Sociohorticulture) to engage in course-related volunteer opportunities.

**Internships & Student Employment**
The Department of Horticultural Sciences establishes and maintains successful partnerships with many industry employers. Each spring for the past 14 years, the Department has hosted a Career Fair enabling employers and students the opportunity to connect. In addition, the Department maintains an active and free job posting board, http://aggies-for-hire.tamu.edu/. Non-profit institutions and nationally-recognized retailers and horticulture firms regularly communicate with the department’s staff to advertise opportunities to students on the departmental bulletin boards, newsletters to students, and the student news and events blog.

**Student Organizations and Clubs**
*The Howdy Farm* - The Howdy Farm is a student-led sustainable farm operated by a University-recognized student group, the Sustainable Agriculture Student Association. The Howdy Farm has grown in prominence and popularity over the five years since its inception. The recipient of two Aggie Green Fund grants, the Howdy Farm is currently undertaking the procurement of a ‘portable sustainability demonstration module’ with this funding to be located behind the horticulture demonstration gardens south of the Horticulture/Forest Science Building. The structure will be ‘off the grid’ and demonstrate micro-sustainability practices and technologies including the use of reclaimed building materials, solar capture and storage, and rainwater harvesting and filtration. The Howdy Farm offers students internships for credit, funds student workers through its seasonal CSA program, and has a robust volunteer labor force that draws students across the University.

*TAMU Horticulture Club* - The Texas A&M Horticulture Club is the campus affiliate of the Association of Collegiate Branches of the American Society for Horticultural Science. The Hort Club travels to the regional and national meetings of ASHS where students participate in the commodity judging contest, undergraduate paper competition, and other activities associated with the ACB. The Club was the national outstanding club in 2010 and 2011, and won the commodity judging competition in 2010 and placed second in 2012. Our students often are elected to leadership positions in the national organization. Taylor Paine served as national president in 2010-11, and Yessica Garcia is national president for 2012-13. The Hort Club supports its participation and travel to meetings through an aggressive fund-raising program including growing and selling containers of bluebonnets, bedding plants, vegetable transplants, and foliage plants at their annual Spring Plant Fair.
SAIFD (Student American Institute of Floral Design) - The TAMU SAIFD is a student group associated with the Forsyth Chapter of the national organization, the American Institute of Floral Design (AIFD). The Texas A&M group is led by Mr. Bill McKinley, Endowed Chair and Director of the Benz School of Floral Design. SAIFD acts as an on-campus flower design/event planner while strengthening student members’ design skills. From the University President’s banquets before Aggie football games and scholarship banquets to Muster and alumni functions, student members of the organization have many opportunities to gain hands-on experience in floral design. The organization also offers funds for an annual trip to the AIFD Symposium for selected student members where they participate in competitions and attend seminars taught by nationally-known floral innovators.

Pi Alpha Xi - The national horticulture honorary annually initiates approximately twenty outstanding juniors and seniors who are nominated by faculty for their outstanding academic achievements.

Undergraduate Student Enrollment Trends
The student enrollment records maintained by the department includes both double major and double degree-seeking candidates and therefore are at a slight variance from the numbers reported by the official university headcount reported by Data and Research Services. The most recently available data indicates a total undergraduate enrollment, including double major/double degree candidates to be 187 students (Table 2.3).

Bachelors degrees awarded by the department have increased by 17% since 2008 (Table 2.4). This increase is due to an increase in the number of BA degrees, and the number of BS degrees awarded has decreased slightly over the same period.

Comparison to Peer Institutions
Many of the aspects of our departmental vision (as well as that of the College and University) require that we compare our programs and performance with that of our peers. We used the FAEIS (Food and Agricultural Education Information System) database to compare enrollments and student demographics to those of our peers among the landgrant university system.

<table>
<thead>
<tr>
<th>Table 2.3 Undergraduate Enrollment by Year</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>FY 2008</td>
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<tr>
<td>FY 2009</td>
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<tr>
<td>FY 2010</td>
</tr>
<tr>
<td>FY 2011</td>
</tr>
<tr>
<td>FY 2012</td>
</tr>
</tbody>
</table>

* Data from Fall 12th day headcounts, DARS
** Data from departmental records including double degrees/double majors

<table>
<thead>
<tr>
<th>Table 2.4 HORT Degrees by Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2008</td>
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<tr>
<td>FY 2009</td>
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<tr>
<td>FY 2010</td>
</tr>
<tr>
<td>FY 2011</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2.5 Standard CIP codes used to report various subdisciplines in horticulture</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIP Code</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>01.0601</td>
</tr>
<tr>
<td>01.0603</td>
</tr>
<tr>
<td>01.0604</td>
</tr>
<tr>
<td>01.0605</td>
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<tr>
<td>01.0606</td>
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<tr>
<td>01.0608</td>
</tr>
<tr>
<td>01.0699</td>
</tr>
<tr>
<td>01.1103</td>
</tr>
</tbody>
</table>
For the sake of these comparisons, we defined our peer institutions as the following: Auburn University, Colorado State University, Cornell University, Iowa State University, Kansas State University, Louisiana State University, Michigan State University, Mississippi State University, North Carolina State University at Raleigh, Oregon State University, Purdue University, The Ohio State University, The Pennsylvania State University, University of California, Davis, University of Florida, University of Georgia, University of Missouri, University of Nebraska- Lincoln, University of Wisconsin- Madison, Virginia Polytechnic Institute and State University, Washington State University

The discipline of horticulture is reported under several CIP codes (classification of instructional programs) in the FAEIS database, and many institutions do not report their statistics by subdiscipline, often deferring to report in the inclusive CIP 01.1103, horticultural science (Table 2.5). The FAEIS data summary presented results from searching all the CIP codes listed, and summing the student numbers in each subdiscipline. We then compared our combined enrollment and number of degrees awarded (BA + BS) over time to the FAEIS data to get a sense for how our enrollment compared to the mean of our peer institutions (Table 2.6).

<table>
<thead>
<tr>
<th>Peer Institution Average (19 peers reporting)</th>
<th>TAMU Horticulture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baccalaureate Enrollment</td>
<td># Graduates</td>
</tr>
<tr>
<td>2007</td>
<td>110</td>
</tr>
<tr>
<td>2008</td>
<td>108</td>
</tr>
<tr>
<td>2009</td>
<td>105</td>
</tr>
<tr>
<td>2010</td>
<td>111</td>
</tr>
<tr>
<td>2011</td>
<td>122</td>
</tr>
<tr>
<td>2012</td>
<td>-</td>
</tr>
</tbody>
</table>

The Texas A&M horticulture program has a higher undergraduate enrollment than the mean of the 19 peer institutions reporting to the FAEIS. Additionally, in the 2011 reporting year (the last year for which data are available), our programs graduated twice the mean number of baccalaureate students compared to the peer mean (Table 2.6). Factors that may explain a higher graduate/enrollment ratio (29% vs 23%) could include the fact that more of our students arrived in the department as transfers than as new freshmen (decreasing their time in our program) or that we have less egress from our programs resulting in a higher percentage of our students actually graduating in our department.

Measurements of Student Retention and Degree Completion
In 2011, nearly 80% of the students who entered the horticulture degree programs completed their degree in our program (Table 2.7). The success rate climbs to nearly 85% when those who transfer to another program prior to graduation are considered.

<table>
<thead>
<tr>
<th>Completion Rate of Juniors After 4 Years</th>
<th>Time to Degree</th>
<th>Baccalaureate Graduate Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal Year</td>
<td>CIP Code</td>
<td>Number in Cohort</td>
</tr>
<tr>
<td>2009</td>
<td>0106</td>
<td>54</td>
</tr>
<tr>
<td>2010</td>
<td>0106</td>
<td>53</td>
</tr>
<tr>
<td>2011</td>
<td>0106</td>
<td>78</td>
</tr>
</tbody>
</table>
Students complete their degrees in just under 11 semesters, and most enroll in between 24 and 26 more than the 120 hours required for graduation. The percentage of students employed has fallen from 65% to 59% from 2009 – 2011, reflective of the overall economic conditions nationally (Table 2.7).

Gender and Ethnic Diversity of the Horticulture Undergraduate Student
Texas A&M University and the College of Agriculture and Life Sciences value ethnic and gender diversity in the student population as well as among the faculty. Diversifying and globalizing the Texas A&M community is one of the twelve imperatives (imperative number 6) of Vision 2020 at the University level and is the first goal in the College and Life Sciences strategic plan: “Enhance and broaden the students’ educational experience to make them better understand the world around them and how different perspectives contribute to its strength.”

The Horticultural Sciences undergraduate student population has become increasingly female during the period of 2008-2012 (Table 2.8, 2.9). Presently, 70% of our undergraduates are female (Table 2.9). In 2010 our population was over 18% Hispanic, but that level of diversity has not been maintained.

<table>
<thead>
<tr>
<th>Table 2.8 Gender and ethnicity of TAMU undergraduate horticulture students during spring semester of indicated year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
</tr>
<tr>
<td>2008</td>
</tr>
<tr>
<td>2009</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>2011</td>
</tr>
<tr>
<td>2012</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2.9 Gender and ethnicity of TAMU undergraduate horticulture students during spring semester of indicated year as percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
</tr>
<tr>
<td>2008</td>
</tr>
<tr>
<td>2009</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>2011</td>
</tr>
<tr>
<td>2012</td>
</tr>
</tbody>
</table>

Other underrepresented minorities account for a very small percentage of our undergraduates.

Gender and Ethnic Diversity of TAMU Horticulture Undergraduate Population Compared to Peers
The undergraduate student populations in our baccalaureate horticulture programs have a much higher percentage of women than the 19 peer institutions reporting in the FAEIS database (70% compared to 40%, respectively) (Tables 2.9, 2.11). Additionally, the percentage of Hispanic students is much higher than the national norm (14.8% compared to 4.7%, respectively). The enrollment of other underrepresented minorities is quite low at TAMU as well as at our peer institutions.
Table 2.10. Gender and ethnicity of undergraduate horticulture students by year from 19 peer institutions (FAEIS database, 25 Feb 2013)

<table>
<thead>
<tr>
<th>Year</th>
<th>Female</th>
<th>Male</th>
<th>Total (M+F)</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Asian</th>
<th>American Indian</th>
<th>African American</th>
<th>Other</th>
<th>Total (all groups)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>638</td>
<td>1261</td>
<td>1899</td>
<td>1720</td>
<td>50</td>
<td>19</td>
<td>13</td>
<td>21</td>
<td>250</td>
<td>2073</td>
</tr>
<tr>
<td>2008</td>
<td>628</td>
<td>1231</td>
<td>1859</td>
<td>1668</td>
<td>54</td>
<td>28</td>
<td>12</td>
<td>26</td>
<td>242</td>
<td>2030</td>
</tr>
<tr>
<td>2009</td>
<td>611</td>
<td>1191</td>
<td>1802</td>
<td>1587</td>
<td>60</td>
<td>33</td>
<td>15</td>
<td>26</td>
<td>261</td>
<td>1982</td>
</tr>
<tr>
<td>2010</td>
<td>686</td>
<td>1195</td>
<td>1881</td>
<td>1505</td>
<td>53</td>
<td>42</td>
<td>17</td>
<td>73</td>
<td>392</td>
<td>2082</td>
</tr>
<tr>
<td>2011</td>
<td>928</td>
<td>1396</td>
<td>2324</td>
<td>1857</td>
<td>108</td>
<td>30</td>
<td>12</td>
<td>32</td>
<td>242</td>
<td>2281</td>
</tr>
</tbody>
</table>

Table 2.11. Gender and ethnicity of undergraduate horticulture students in indicated year from 19 peer institutions as percentage of total (FAEIS database, 25 Feb 2013)

<table>
<thead>
<tr>
<th>Year</th>
<th>Female</th>
<th>Male</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Asian</th>
<th>American Indian</th>
<th>African American</th>
<th>Other</th>
<th>Total (all groups)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>33.6</td>
<td>66.4</td>
<td>83.0</td>
<td>2.4</td>
<td>0.9</td>
<td>0.6</td>
<td>1.0</td>
<td>12.1</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>33.8</td>
<td>66.2</td>
<td>82.2</td>
<td>2.7</td>
<td>1.4</td>
<td>0.6</td>
<td>1.3</td>
<td>11.9</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>33.9</td>
<td>66.1</td>
<td>80.1</td>
<td>3.0</td>
<td>1.7</td>
<td>0.8</td>
<td>1.3</td>
<td>13.2</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>36.5</td>
<td>63.5</td>
<td>72.3</td>
<td>2.5</td>
<td>2.0</td>
<td>0.8</td>
<td>3.5</td>
<td>18.8</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>39.9</td>
<td>60.1</td>
<td>81.4</td>
<td>4.7</td>
<td>1.3</td>
<td>0.5</td>
<td>1.4</td>
<td>10.6</td>
<td></td>
</tr>
</tbody>
</table>

Assessment of Learning Outcomes

Annual assessment of the baccalaureate programs in horticulture was started in the 2008-2009 academic year. The undergraduate assessment plan was developed over the course of more than a year of workshops, faculty meetings, and interaction with colleagues at peer institutions. The planning activity culminated in the appointment of the departmental assessment committee in June, 2008 which was charged with the finalization of the learning outcome statements, formulation of achievement targets, development of outcome measures, and oversight of annual report preparation and entry into the Texas A&M University assessment and planning management system, WeaveOnline (http://assessment.tamu.edu/weave/weave_index.html).

The primary measures used to assess the Bachelor of Arts and Bachelor of Science programs are the same because the fundamental learning outcomes of the programs are so similar. Differences between the two programs are accounted for when the assessment committee evaluates the selected transcripts and eportfolios considering the degree program in which the students are enrolled. For example, the visual expectations and artifacts presented in a portfolio from a student with an emphasis in floral design/event planning (BA) are expected to be different from those expected of a student with an emphasis in fruit and vegetable production (BS).

Not all measures are collected every year. The frequency of use of the measures and the outcomes which they are designed to assess are indicated below:

1. **Academic transcript review** (annually; outcome assessed 1*)
   Academic transcripts of 20 randomly selected students (grouped by major and specialization) are reviewed by the Departmental Assessment Committee using a common rubric. These records are examined for overall performance, with special attention given to courses in which students appear to be performing either above or below expectations. Problems in student performance are noted and
recommendations on how to correct these deficiencies are proposed to the department head.

2. **Portfolio review** (annually; outcomes assessed 1, 2, 3, 4, 5, 8, 9)

   Students demonstrate their grasp of computer technology, writing skills, organization, and graphic communication by the sample projects included in their portfolios. The portfolio contains examples of computer graphic/landscape design projects, photographs of floral designs, photographs of other special projects, sample presentations (either as slide sets or video recordings), or other examples that demonstrate the students’ competence in using technology to construct and communicate project work. The portfolios of 10 randomly selected students graduating in each degree program are reviewed and evaluated by the assessment committee using a common rubric.

3. **Employer survey** (2009-2010 year; outcomes assessed 1, 5, 7)

   Employers who hire students for university-sponsored internships and full-time positions are asked to complete a Web-based survey evaluating students' aptitude in general plant knowledge, specific horticultural knowledge, and other fundamental plant science knowledge (soils, plant pathology, entomology, etc.). Employer surveys are summarized and examined for any general trends that impact the perception of "job readiness" of our students.

4. **Graduating senior survey** (annually; outcome assessed 1, 2, 3, 4, 7, 8, 9)

   Graduating students are asked to complete a Web-based survey designed to determine perceptions of how well they were prepared for the job they accepted. The survey is administered when the students took HORT 481, Senior Seminar. Students were asked to self assess their competency, skills, abilities and attitudes related to horticulture in general in and specific, society and their interaction with others.

5. **Alumni self-assessment survey** (2008 – 2009; outcomes assessed 5, 6, 7, 8)

   Students who graduated in horticulture were asked to complete a Web-based survey designed to determine perceptions of how well they were prepared for the job they accepted. They also were asked to self assess their competency, skills, abilities and attitudes related to horticulture in general in and specific, society and their interaction with others.

6. **Critical thinking assessment test** (2009-2010 year; outcome assessed 5)

   Students enrolled in HORT 481, Senior Seminar, in the fall, 2009 class served as a test group to determine the usefulness of using the CAT (Critical Thinking Assessment test) to gauge the critical thinking ability of students in the programs.

7. **Participation in leadership activities** (annually; outcomes assessed 6, 7)

   Participation of our students in extracurricular activities such as pre-professional clubs, judging contests and attendance at professional meetings such as the American Society for Horticultural Science (ASHS), Southern Region ASHS, American Insitute of Floral Designers, etc. are used to estimate pre-professional training and leadership development.

*Abbreviated outcome statement (refer to full statement on page 2.1)*

1. Demonstrate science-based knowledge
2. Demonstrate knowledge of how plants impact people
3. Communicate core horticultural knowledge
4. Competency in using electronic technology
5. Demonstrate critical-thinking ability
6. Graduates will become responsible citizens
7. Students will gain experience in teamwork
8. Graduates will become lifelong learners
9. Graduates will demonstrate awareness of global horticulture

**Examples of Assessment Tools and Findings**

The assessment of student eportfolios as indicators of learning is receiving increased emphasis at a number of peer institutions (notably Virginia Tech and Clemson) because they allow evaluation of a number of different skills and abilities, as well as an overview of the level of the student’s comprehension of concepts, their ability to express themselves in written and graphic form, their ability to manage computer technology, and their ability to reflect on the learning experiences to which they have been exposed. Texas A&M University has evaluated, and is implementing a module within Blackboard Learn, the eCampus Portfolio, that will facilitate campus-wide
adoption of eportfolios in the near future.

We have used a number of different systems to create the eportfolios (ex. the TAMU student Webspace on people.tamu.edu) but we have now settled on Googlesites as a convenient platform. Googlesites are free and the students can “carry their eportfolio Website” with them after graduation, and have them evolve into a site that can be used in their later professional careers. A starter template with a graphic presentation similar to the standard College of Agriculture and Life Sciences Web template has been created to give students a quick start into the process since very little instructional time is devoted to teaching the process of Website creation. An example of the HORTfolio template is presented below.

Students are introduced to the eportfolio project briefly in HORT 101 and more extensively in the learning community, HORT 225. Ideally, we will progress to the point where the eportfolios are all started in HORT 101,
will serve as a collecting point for artifacts of learning throughout the students’ undergraduate programs, and will be completed during HORT 481, Senior Seminar.

The five-member departmental assessment committee evaluates the eportfolios annually using a standard rubric (Table 2.12).

**Table 2.12 Rubric used for evaluation of student eportfolios. Scale extends from “unacceptable = 1” to “exceptional” = 5).**

<table>
<thead>
<tr>
<th>Case Identifier:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessor:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Program:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluation Criterion</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Portfolio Website created and serving</strong></td>
<td>UA</td>
<td>A</td>
<td>EX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Website responds to address provided, graphics of template provided or optional template complete, images all present, links to sections work, sections representing resume, projects, writing samples, designs (as appropriate), contact info, and about me are present</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Website presents evidence for technological competence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Website has orderly appearance; links to documents and attachments all work; images load quickly; images are of appropriate resolution and proper proportionality; documents as artifacts are PDF and not proprietary format; documents present evidence for understanding of technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Portfolio exhibits adequate disciplinary strength</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work presented exemplifies excellent grasp of fundamentals of academic emphasis area (ex. Quality of designs, complexity of projects, summaries of research); adequate number of artifacts presented to assess;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Portfolio exhibits professionalism</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall impression gained from portfolio is that it represents the work of a well-educated horticultural professional</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Communication elements in portfolio satisfactory</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student uses the correct terminology of the field; portfolio is free of spelling and grammatical errors; reflective statements are adequate in number and in complexity of thought; layout and overall appearance are creative, pleasing, and effective</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The sample portfolios evaluated in 2012 from students in the BA program were rated substantially higher on all criteria than those in the BS (Table 2.13). While the program learning outcomes assessment reports do not specifically compare the performance of BA and BS students (each program report is independent of the other), this year’s evaluation did raise concerns among the assessment committee members. The eportfolios of BS students were “below expectations,” i.e., means less than 3.0, in 4 of the 5 evaluation criteria. The rubric was revised in 2012, and some on the committee thought this might have been a factor. Additionally, since the sample eportfolios were selected at random, and since the number of samples was very small (only 10 portfolios per degree program), it is possible that one year’s results may not be conclusive. The committee has elected to track the portfolio evaluations for another year before taking any definitive action. This discussion is an excellent example of insuring that the data, in fact, are real. If, for example, students in the BS program are evaluated as having not met expectations in the areas of technological competence, disciplinary strength, professionalism, or
communication skills, while those students in the BA have met expectations, then clearly some definitive action to modify the curriculum is warranted.

<table>
<thead>
<tr>
<th>Evaluation Criterion</th>
<th>BS</th>
<th>BA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio Website created and serving</td>
<td>3.0</td>
<td>3.8</td>
</tr>
<tr>
<td>Website presents evidence for technological competence</td>
<td>2.6</td>
<td>3.4</td>
</tr>
<tr>
<td>Portfolio exhibits adequate disciplinary strength</td>
<td>2.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Portfolio exhibits professionalism</td>
<td>2.6</td>
<td>3.3</td>
</tr>
<tr>
<td>Communication elements in portfolio satisfactory</td>
<td>2.4</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Students are surveyed in the year in which they are graduating, and asked their perceptions of their preparedness in areas ranging from plant problem recognition to their ability to perform mathematical calculations. Our survey was based on the survey implemented for outcomes assessment at Iowa State University with minor modification. For annual assessment reporting, survey data are collected and analyzed on a academic year basis. For the purposes of this discussion, however, data from academic years 2009 – 2012 were merged and analyzed to increase the sample size and to create a longer-range snapshot of student perceptions.

Our students report less satisfaction with their preparedness in areas that involve an integrated systems approach (recognizing plant problems, management of plant growth in artificial media, horticultural production strategies, laws and regulations, horticultural practices used in other parts of the world) and the perceptions differ between the BA and BS degree programs as would be expected (Table 2.14).

<table>
<thead>
<tr>
<th>How satisfied were you with each of the following aspects of your educational program at Texas A&amp;M University?</th>
<th>BA (mean of 64)</th>
<th>BS (mean of 62)</th>
<th>DIFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall quality of education within your major</td>
<td>4.46</td>
<td>4.55</td>
<td>-0.09</td>
</tr>
<tr>
<td>Usefulness of skills and knowledge taught</td>
<td>4.43</td>
<td>4.58</td>
<td>-0.15</td>
</tr>
<tr>
<td>Quality of instruction by faculty in your major</td>
<td>4.54</td>
<td>4.68</td>
<td>-0.14</td>
</tr>
<tr>
<td>Quality of instruction by faculty outside of your major</td>
<td>4.14</td>
<td>4.15</td>
<td>-0.01</td>
</tr>
<tr>
<td>Personal contact with faculty in your major</td>
<td>4.58</td>
<td>4.74</td>
<td>-0.16</td>
</tr>
<tr>
<td>Appropriateness of courses in your major</td>
<td>4.37</td>
<td>4.5</td>
<td>-0.13</td>
</tr>
<tr>
<td>Variety of courses in your major</td>
<td>4.35</td>
<td>4.39</td>
<td>-0.04</td>
</tr>
<tr>
<td>Quality of academic advising</td>
<td>4.37</td>
<td>4.63</td>
<td>-0.26</td>
</tr>
<tr>
<td>Quality of quality of facilities and resources</td>
<td>4.46</td>
<td>4.61</td>
<td>-0.15</td>
</tr>
<tr>
<td>What is your feeling about your competence in the following areas?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apply basic horticulture knowledge</td>
<td>4.28</td>
<td>4.48</td>
<td>-0.2</td>
</tr>
<tr>
<td>Understand horticultural terminology</td>
<td>4.34</td>
<td>4.43</td>
<td>-0.09</td>
</tr>
<tr>
<td>Have a basic understanding of technical principles (nutrition, planting, propagation, etc.)</td>
<td>4.14</td>
<td>4.52</td>
<td>-0.38</td>
</tr>
<tr>
<td>Implement horticulture production strategies (harvest, quality, storage, etc)</td>
<td>3.92</td>
<td>4.03</td>
<td>-0.11</td>
</tr>
<tr>
<td>Recognize plant problems</td>
<td>3.77</td>
<td>3.83</td>
<td>-0.06</td>
</tr>
<tr>
<td>Understand management of soil-based and artificial substrates</td>
<td>3.47</td>
<td>3.98</td>
<td>-0.51</td>
</tr>
<tr>
<td>Plant identification</td>
<td>3.98</td>
<td>3.96</td>
<td>0.02</td>
</tr>
<tr>
<td>Have general knowledge of horticultural practices used in other parts of the world</td>
<td>3.67</td>
<td>3.81</td>
<td>-0.14</td>
</tr>
<tr>
<td>Have an integrated concept of the ecosystem</td>
<td>3.84</td>
<td>4.19</td>
<td>-0.35</td>
</tr>
<tr>
<td>Understand basic business concepts</td>
<td>4.22</td>
<td>3.69</td>
<td>0.53</td>
</tr>
</tbody>
</table>

**What is your feeling about your skill level in the following areas?**

| Present an oral report | 4.23 | 4.23 | 0 |
| Write a concise report | 4.34 | 4.3 | 0.04 |
| Debate issues | 3.92 | 4 | -0.08 |
| Motivate and organize others when problem solving | 4.45 | 4.27 | 0.18 |
| Work as part of a team | 4.61 | 4.56 | 0.05 |
| Effective use of technology in the workplace | 4.41 | 4.24 | 0.17 |
| Define problems and propose solutions | 4.54 | 4.43 | 0.11 |
| Analyze and interpret data | 4.36 | 4.17 | 0.19 |
| Seek out opportunities for continued education | 4.28 | 4.1 | 0.18 |
| Use resources such as libraries, journals, and electronic sources | 4.4 | 4.05 | 0.35 |
| Network with others in your profession, including other former students, university faculty and extension professionals | 4.38 | 4.31 | 0.07 |
| Perform mathematical calculations | 3.6 | 3.74 | -0.14 |
| Interpret laws and regulations | 3.95 | 3.91 | 0.04 |

**What is your feeling about your capabilities in the following areas?**

| Possess an awareness of rural and urban influences of horticulture | 4.25 | 4.26 | -0.01 |
| Recognize moral, legal, and ethical conflicts | 4.56 | 4.4 | 0.16 |
| Appreciate the individual's role in sustainable management | 4.47 | 4.47 | 0 |
| Possess high standards of achievement | 4.58 | 4.52 | 0.06 |
| Appreciate cultural differences | 4.61 | 4.45 | 0.16 |
| Tolerate different beliefs | 4.58 | 4.39 | 0.19 |
| Application of economic and social science concepts to human interactions and organizations | 4.45 | 4.28 | 0.17 |
| Have professional resume and interview skills | 4.55 | 4.46 | 0.09 |

**Did you register for and complete successfully HORT484, Internship Experience?**

| yes | 9 | 12 | -3 |
| no | 52 | 40 | 12 |

**Numerical scale values:** 5 - Very satisfied; 4 – Satisfied; 3 – Neutral; 2 – Dissatisfied; 1 - Very dissatisfied; NA - Not Considered

During the 2012-13 academic year, a similar version of the survey was revised and presented to members of the horticulture industry to gauge their satisfaction with the preparedness of our students as they performed in full-time jobs or in internships. On almost all of the criteria, employers report a satisfaction higher than 70 on a scale of 0 to 100, indicating a very positive perception of students from our programs. Two areas in the 70 or below range (ability to diagnose plant problems, general knowledge of the global dimensions of horticultural business)
were also identified by graduating seniors as areas potentially needing improvement, so the faculty need to examine the way we prepare out students in these areas and develop more effective alternatives.

Table 2.15. Responses of horticultural employers when asked for their opinions of the preparedness of graduates from the Texas A&M horticulture baccalaureate programs.

<table>
<thead>
<tr>
<th></th>
<th>Min Value</th>
<th>Max Value</th>
<th># Responses</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please rate the importance of each of the following indicators of experience in your consideration for hiring a new employee:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtained four-year degree in horticulture</td>
<td>1</td>
<td>100</td>
<td>23/24</td>
<td>67.3</td>
</tr>
<tr>
<td>Completed an internship</td>
<td>0</td>
<td>91</td>
<td>19/24</td>
<td>44.2</td>
</tr>
<tr>
<td>Worked for another firm similar to yours</td>
<td>0</td>
<td>85</td>
<td>20/24</td>
<td>37.4</td>
</tr>
<tr>
<td>Completed an international/study abroad experience</td>
<td>0</td>
<td>65</td>
<td>15/24</td>
<td>14.9</td>
</tr>
<tr>
<td>Able to speak Spanish</td>
<td>0</td>
<td>92</td>
<td>20/24</td>
<td>38.6</td>
</tr>
<tr>
<td>Based on your experience with Texas A&amp;M Horticulture graduates, please rate your satisfaction with their competence in the following areas:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General horticultural knowledge</td>
<td>62</td>
<td>100</td>
<td>21/24</td>
<td>86.0</td>
</tr>
<tr>
<td>Technical knowledge of horticultural practices</td>
<td>19</td>
<td>100</td>
<td>21/24</td>
<td>75.5</td>
</tr>
<tr>
<td>Ability to recognize a problem and independently find information to address it</td>
<td>40</td>
<td>100</td>
<td>21/24</td>
<td>80.2</td>
</tr>
<tr>
<td>Communication ability</td>
<td>61</td>
<td>100</td>
<td>21/24</td>
<td>83.7</td>
</tr>
<tr>
<td>Leadership potential</td>
<td>52</td>
<td>100</td>
<td>21/24</td>
<td>79.4</td>
</tr>
<tr>
<td>Ethical behavior</td>
<td>50</td>
<td>100</td>
<td>21/24</td>
<td>93.3</td>
</tr>
<tr>
<td>Based on your experience with Texas A&amp;M Horticulture graduates, please rate your satisfaction with their ability to perform the following tasks:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present and oral report</td>
<td>0</td>
<td>100</td>
<td>20/24</td>
<td>72.4</td>
</tr>
<tr>
<td>Write a concise report</td>
<td>0</td>
<td>100</td>
<td>19/24</td>
<td>75.2</td>
</tr>
<tr>
<td>Thoughtfully formulate and present position on issues</td>
<td>0</td>
<td>91</td>
<td>19/24</td>
<td>72.3</td>
</tr>
<tr>
<td>Motivate and organize others when problem-solving</td>
<td>0</td>
<td>91</td>
<td>19/24</td>
<td>74.3</td>
</tr>
<tr>
<td>Use technology effectively in the workplace</td>
<td>0</td>
<td>100</td>
<td>19/24</td>
<td>84.1</td>
</tr>
<tr>
<td>Ability to diagnose plant problems</td>
<td>0</td>
<td>100</td>
<td>19/24</td>
<td>70.0</td>
</tr>
<tr>
<td>Based on your experience with Texas A&amp;M Horticulture graduates, please rate the degree to which you think they conform to industry expectations in regard to the following character traits:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work as part of a team</td>
<td>0</td>
<td>100</td>
<td>20/24</td>
<td>83.2</td>
</tr>
<tr>
<td>Possess high standards of achievement</td>
<td>0</td>
<td>100</td>
<td>20/24</td>
<td>83.0</td>
</tr>
<tr>
<td>Have general knowledge of the global dimensions of horticultural business</td>
<td>0</td>
<td>100</td>
<td>20/24</td>
<td>68.7</td>
</tr>
<tr>
<td>Recognize moral, legal, and ethical conflicts</td>
<td>0</td>
<td>100</td>
<td>20/24</td>
<td>81.3</td>
</tr>
<tr>
<td>Appreciate the individual’s role in sustainable management</td>
<td>0</td>
<td>100</td>
<td>19/24</td>
<td>76.1</td>
</tr>
<tr>
<td>Appreciate cultural differences</td>
<td>0</td>
<td>100</td>
<td>19/24</td>
<td>78.8</td>
</tr>
<tr>
<td>Tolerate and respect different beliefs and opinions</td>
<td>0</td>
<td>100</td>
<td>20/24</td>
<td>81.1</td>
</tr>
<tr>
<td>Application of economic and social science concepts to human interactions and organizations</td>
<td>0</td>
<td>100</td>
<td>19/24</td>
<td>75.4</td>
</tr>
</tbody>
</table>
Data from the 2010 survey of horticultural employers indicate that a majority of employers consider our graduates much better or better than other employees hired with similar degrees, and almost all would hire another TAMU graduate. Sixty-eight percent of the respondents consider our students well prepared for an entry level position in the industry (Table 2.16).

During the 2010 assessment cycle horticulture industry employers and former students who graduated from our programs were surveyed with instruments that contained similarly stated questions, and those responses were compared (Table 2.17). Areas of particular interest (those in the 3-4/5 range) are highlighted in Table 2.17, and those of particular interest are ones in which the employers and former students perceptions differ markedly. Former students (as a whole, and with acknowledgement of the small sample sizes!) have a higher perception of their technical knowledge of horticultural practices and their ability to solve/diagnose problems. Both groups agree that our graduates’ preparedness to participate in the global dimensions of horticultural business are less well developed than most of their other capabilities.

Survey data such as those illustrated have been used by the faculty as justification for the renewed emphasis on formal internships and increased attention to studies abroad and international programs, the two cornerstones of our Activity 2015, high-impact, experiential learning program. We need to increase the breadth of the horticulture industries responding to our surveys, as our sampling now is very heavy from the green industry. As more of our students enter careers in events management, wine tourism, sustainable production, and commercial sales, so too must our outreach for advice and evaluation of our programs.

<table>
<thead>
<tr>
<th>Table 2.16. Opinions of horticultural employers concerning graduates from the Texas A&amp;M horticulture baccalaureate programs. From 2010 assessment survey data; n=30.</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do graduates of the Texas A&amp;M University Horticulture program compare to other employees you or your firm have hired with similar degrees?</td>
</tr>
<tr>
<td>much better than others</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>Would you hire another graduate from the Texas A&amp;M Horticulture Program?</td>
</tr>
<tr>
<td>definitely</td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>Do you consider graduates from the Texas A&amp;M Horticulture Program adequately prepared for an entry-level position in the workforce?</td>
</tr>
<tr>
<td>definitely</td>
</tr>
<tr>
<td>19</td>
</tr>
</tbody>
</table>
Table 2.17. Responses of horticultural employers and former students when asked for their opinions of the preparedness of graduates from the Texas A&M Horticulture baccalaureate programs. From 2010 assessment survey data.

<table>
<thead>
<tr>
<th></th>
<th>Employer n=30</th>
<th>Former Student n=83</th>
<th>Diff</th>
</tr>
</thead>
</table>

*Please rate the importance of each of the following indicators of experience in your consideration for hiring a new employee:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Employer</th>
<th>Former Student</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtained four-year degree in horticulture</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed an internship</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worked for another firm similar to yours</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed an international/study abroad experience</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Able to speak Spanish</td>
<td>2.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Based on your experience with Texas A&M Horticulture graduates, please rate your satisfaction with their competence in the following areas:

<table>
<thead>
<tr>
<th>Area</th>
<th>Employer</th>
<th>Former Student</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>General horticultural knowledge</td>
<td>4.17</td>
<td>4.58</td>
<td>.41</td>
</tr>
<tr>
<td>Technical knowledge of horticultural practices</td>
<td>3.61</td>
<td>4.5</td>
<td>.89</td>
</tr>
<tr>
<td>Ability to recognize a problem and independently find information to address it</td>
<td>4.07</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Communication ability</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership potential</td>
<td>3.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethical behavior</td>
<td>4.41</td>
<td>4.26</td>
<td>.15</td>
</tr>
</tbody>
</table>

**Based on your experience with Texas A&M Horticulture graduates, please rate your satisfaction with their ability to perform the following tasks:

<table>
<thead>
<tr>
<th>Task</th>
<th>Employer</th>
<th>Former Student</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present and oral report</td>
<td>4</td>
<td>4.31</td>
<td>.31</td>
</tr>
<tr>
<td>Write a concise report</td>
<td>3.96</td>
<td>4.25</td>
<td>.29</td>
</tr>
<tr>
<td>Thoughtfully formulate and present position on issues</td>
<td>4.13</td>
<td>3.95</td>
<td>.18</td>
</tr>
<tr>
<td>Motivate and organize others when problem-solving</td>
<td>3.81</td>
<td>4.33</td>
<td>.52</td>
</tr>
<tr>
<td>Use technology effectively in the workplace</td>
<td>4.23</td>
<td>4.39</td>
<td>.16</td>
</tr>
<tr>
<td>Ability to diagnose plant problems</td>
<td>3.56</td>
<td>4.07</td>
<td>.51</td>
</tr>
</tbody>
</table>

**Based on your experience with Texas A&M Horticulture graduates, please rate the degree to which you think they conform to industry expectations in regard to the following character traits:

<table>
<thead>
<tr>
<th>Character Trait</th>
<th>Employer</th>
<th>Former Student</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work as part of a team</td>
<td>4.26</td>
<td>4.56</td>
<td>.30</td>
</tr>
<tr>
<td>Possess high standards of achievement</td>
<td>4.22</td>
<td>4.66</td>
<td>.44</td>
</tr>
<tr>
<td>Have general knowledge of the global dimensions of horticultural business</td>
<td>3.45</td>
<td>3.44</td>
<td>.01</td>
</tr>
<tr>
<td>Recognize moral, legal, and ethical conflicts</td>
<td>4.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appreciate the individual’s role in sustainable management</td>
<td>3.58</td>
<td>4.17</td>
<td>.59</td>
</tr>
<tr>
<td>Appreciate cultural differences</td>
<td>4</td>
<td>4.51</td>
<td>.51</td>
</tr>
<tr>
<td>Tolerate and respect different beliefs and opinions</td>
<td>4.11</td>
<td>4.42</td>
<td>.31</td>
</tr>
<tr>
<td>Application of economic and social science concepts to human interactions and organizations</td>
<td>3.78</td>
<td>3.97</td>
<td>.19</td>
</tr>
<tr>
<td>How do graduates of the TAMU Horticulture program compare to other employees you or your firm have hired</td>
<td>2.83/4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would you hire another grad from the TAMU Hort Program?</td>
<td>3.55/4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you consider grads from the TAMU Hort Program well prepared for an entry-level position in the workforce?</td>
<td>3.5/4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*5=Required 4=Critically Important 3=Somewhat Important 2=Slightly Important 1=Not Important NA=Not Considered
**5=Completely 4=Mostly 3=Somewhat 2=Slightly 1=Not at all NA=Not Observed
3. OVERVIEW OF GRADUATE PROGRAMS

The Department of Horticultural Sciences offers two Masters degrees (Master of Science, Master of Agriculture) and the Doctor of Philosophy in Horticulture. A cooperative doctoral program with faculty at Texas A&M University at Kingsville is offered as a component of the Ph. D. in Horticulture. Faculty in Horticultural Sciences participate in several interdisciplinary programs (Molecular and Environmental Plant Sciences (MEPS; formerly Plant Physiology), Plant Breeding, Genetics, and Food Science and Technology.

Graduate Courses Offered in the Department of Horticultural Sciences

Advanced work in horticulture may be conducted with areas of specialization in fruit production, nut production, vegetable production, ornamental horticulture and nursery crops, and fruit, nut and vegetable processing. Supporting work may be required in several of the related fields such as chemistry, botany, plant pathology, plant physiology, entomology, soils, genetics, nutrition and agricultural engineering. The specific objective of the individual student will guide his or her committee in the choice of courses from the departments mentioned above and others in special cases.

Programs of study leading to the Master of Agriculture, Master of Science and Doctor of Philosophy degrees are available.

601. Nutrition of Horticultural Plants. (3-3). Credit 4. Principles of nutrition related to horticultural plants; micro- and macronutrients; root uptake; short- and long-distance transport; management practices of fruit, nut, ornamental and vegetable plants; development of skills in nutrition research. Prerequisite: MEPS 313 or approval of instructor.*

604. Applied Physiology of Horticultural Crops. (3-0). Credit 3. Chemical, biological and environmental factors in growth and differentiation and their application to ornamental, fruit and vegetable crops; growth kinetics; source-sink relations; fruit development; seed development and germination; juvenility; apical dominance; growth retardants; pruning; photonperiodism; flowering; sex expression; and senescence. Prerequisites: MEPS 313 or approval of instructor.

605. Internet Applications for Horticulture. (2-2). Credit 3. Internet applications for horticulture presents the theory and practice of computer networks and networking so that the information and educational content (not the hardware) is the key; the focus is on the World Wide Web and creating Web materials for teaching, research and extension applications. Prerequisite: Graduate classification.

608. Plants for Landscape Design. (3-2). Credit 4. Identification and use of indigenous and introduced plants in landscape designs; plants for special uses in commercial and residential developments; emphasis on ornamental attributes, identification, cultural requirements, limitations and adaptability in urban and suburban environments for important taxa; discussion of current issues, research, and trends in selection, marketing, and utilization of plants for landscape design. Prerequisite: HORT 201 or HORT 308 or BIOL 101, or approval of instructor, not open to students with previous credit for HORT 306.*

609. Plants for Landscape Design II. (3-2). Credit 4. Identification and use of indigenous and introduced landscape plants; plants for special uses in urban environments; emphasis on plants’ ornamental attributes, cultural requirements, and adaptability in urban and suburban environments. Not open to students who have completed HORT 308. Prerequisites: BOTN 101, HORT 201, HORT 306, HORT 608, or approval of instructor.

610. Physiological and Molecular Basis for Plant Stress Response. (3-0). Credit 3. Provide the student with tools to understand the molecular and physiological consequences caused by environmental factors (abotic and biotic) on plant growth and development and the mechanisms of stress adaptation to stress. Prerequisite: MEPS 313 or equivalent. Cross-listed with MEPS 610.

611. Ecology of Urban Landscape. (3-0). Credit 3. Basic concepts and current topics in ecology or urban
landscapes. Role of plants in urban and fragmented ecosystems ranging from individual plant responses to changes in ecosystem function. Students will discuss recent literature in the field of urban plant ecology. Prerequisite: An undergraduate or graduate class in plant biology or plant ecology is recommended.

618. Root Biology. (3-0). Credit 3. Basic concepts and current topics in root-soil ecology; managed and natural ecosystems including grasslands, cropping systems and forests; role of roots in the rhizosphere, the effects of soil, nutrient and water stress and climate change in C and N cycling and carbon sequestration; participate in discussions and critique recent literature. Prerequisite: Approval of instructor. Cross-listed with MEPS 618.

622. Citrus and Subtropical Fruits. (3-0). Credit 3. Various types of citrus; identification, culture, processing, marketing, and the economic future; prepares students to function in a continuously changing production environment in production areas. Prerequisite: Approval of instructor.

626. International Floriculture Marketing. (2-2). Credit 3. Importance, cost and opportunities in marketing floral products, fresh cut flowers, flowering potted plants, foliage plants, and bedding/garden plants; topics include world production areas, economic value, species grown, marketing channels, retail environments, current/future consumers, postharvest handling, promotion/advertising, perceived/added value, marketing trends and employment opportunities. Prerequisite: Graduate classification.

630. Post-Harvest Biology, Physiology and Genetics of Plants. (3-0). Credit 3. Overview of biological, physiological and genetic mechanisms which impart phenotypes associated with quality and value of plant products; current emphasis in areas of ripening, senescence, fruit and flower development, and relevant applications of biotechnology will be focus of course. Prerequisite: Approval of instructor. Cross-listed with MEPS 630.

640. Phytochemicals in Fruits and Vegetables to Improve Human Health. (3-0). Credit 3. Current scientific knowledge about the role of phytochemicals in their diet; increase the knowledge and awareness of successful, cost effective, public and private integrated approaches to reduce the health and economic burden of chronic diseases; provide instructional curricular resources media for dissemination through conventional and distance education technology. Prerequisite: Approval of Instructor.

644. Food Quality. (3-0). Credit 3. Physical, chemical and biological properties of foods; fundamental attributes of flavor, color, odor and texture; esthetic, ethnic and nutritional requirements; role of additives; regulatory standards and quality control regimes; current techniques in food investigations.*

645. World Agriculture and International Plant Breeding. (1-0). Credit 1. Evolution of world agriculture; plant breeding and improved varieties; international agricultural research centers and green revolution; population growth; environmental challenges; IPR; role of plant breeding and biotechnology in meeting world food needs. Prerequisite: SCSC 304, HORT 404 or approval of instructor. Cross-listed with SCSC 645.

681. Seminar. (1-0). Credit 1. Student and staff participation in review of literature and reporting on current developments in research on production and processing of horticultural crops. Required of all graduate students in horticulture and floriculture.

684. Professional Internship. Credit 1 to 4. Program planned to provide professional training in student’s particular field of interest. Faculty and employer will supervise the activity. Work-study planned as a part of the Master of Agriculture degree program in fruit, ornamentals or vegetable production, processing and handling or landscape or garden design and maintenance. Prerequisite: Approval of instructor.

685. Directed Studies. Credit 1 to 4 each semester. Individual problems of research or scholarly activity not pertaining to thesis or dissertation, or selected instruction not covered by other courses. Final documentation of directed study is required. Prerequisite: Approval of instructor.
689. Special Topics in... Credit 1 to 4. Selected topics in an identified area of horticulture. May be repeated for credit. Prerequisite: Approval of department head.

690. Theory of Research. (1-0). Credit 1. Design of research experiments in various fields of horticulture and floriculture and evaluation of results with the aid of examples taken from the current scientific literature. May be repeated for credit.

691. Research. Credit 1 or more each semester. Research in horticultural problems for thesis or dissertation.

693. Professional Study. Credit 1 to 9. Approved professional paper undertaken as the requirement for the Master of Agriculture. May be taken more than once, but not to exceed 3 hours of credit towards a degree. Prerequisite: Graduate classification.

Comparison of the Texas A&M University Department of Horticultural Sciences’ Graduate Horticulture Degrees With Others on a National Scale

After a period of interim leadership of the Department, a new Department Head was appointed in late August 2012 and a new Associate Head for Graduate Programs was appointed on October 1. One of the first tasks was to assess the current state of our academic programs and to determine how we were performing in relation to peers on a national level in preparation for the Academic Program Review. Initial meetings to address immediate needs for advancing and updating graduate program policies were initiated. Also, on October 11, 2012 a survey of U.S. and Canadian universities that offer graduate degree programs with majors in horticulture or concentrations in horticulture within broader based related plant science majors was initiated. The goal of this effort was to determine demographics related to our sister (and competing) programs nationally; determine how a variety of programmatic requirements and procedures were handled; determine the types of graduate programs and support provided by other departments; determine how our student demographics compared with those of our peer institutions; determine how departments were financing students and what types of training they were providing; and to document demographics associated with the faculty at peer institutions (Table 3.1).

<table>
<thead>
<tr>
<th>Table 3.1 Institutions participating in the national 2012 horticulture graduate survey.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Grant University Respondents</td>
</tr>
<tr>
<td>University of Arkansas</td>
</tr>
<tr>
<td>Kansas State University</td>
</tr>
<tr>
<td>University of Tennessee</td>
</tr>
<tr>
<td>Cornell University</td>
</tr>
<tr>
<td>Oklahoma State University</td>
</tr>
<tr>
<td>Auburn University</td>
</tr>
<tr>
<td>Virginia Tech University</td>
</tr>
<tr>
<td>Iowa State University</td>
</tr>
<tr>
<td>Louisiana State University</td>
</tr>
<tr>
<td>Mississippi State University</td>
</tr>
<tr>
<td>Florida Environ. Horticulture</td>
</tr>
</tbody>
</table>

Characterization of Horticulture Degree or Concentration Programs
Among 1862 land grant universities, 36% of horticulture graduate programs were in stand-alone horticulture departments and 50% were in blended units with one or more related disciplines. Only 14% were in general plant science departments and none were in general agriculture or life sciences units. In contrast horticulture programs at state or provincial universities were all housed in either general plant science departments or general agriculture/life sciences units. The number of programs offering horticulture-oriented graduate degrees at land
grant institutions was similar to that reported in 2005 (Arnold et al.), although considerably fewer non-land grant institutions responded to the current survey (five versus thirteen previously).

Ph.D. programs were about evenly split between those with a horticulture major and those with concentrations in horticulture within a broader plant science major (Table 3.2). However, enrollment in the plant science major was approximately twice that of horticulture-only programs and was the only option offered in state/provincial Ph.D. programs. Slightly more M.S. thesis and non-thesis programs had horticulture only majors than were present as concentrations within plant science M.S. programs, although as with the Ph.D. programs about twice as many students were present in the plant science than in the horticulture majors (Table 3.2).

An additional source of comparative data for enrollments in horticulture graduate programs is the FAEIS database. The reported enrollments do not match exactly (likely as a result of differences in program titles reported, i.e. differences in CIP codes), however, examination of the trends supports the conclusions derived from the national survey (Table 3.3).

<table>
<thead>
<tr>
<th>Table 3.2. Degrees offered in residence by units offering either degree programs with a horticulture major or those with a more generalized plant science type major with some type of specialization in horticulture. 2012 national survey data.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Programs</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Ph.D. Horticulture</td>
</tr>
<tr>
<td>Ph.D. Plant Science (thesis)</td>
</tr>
<tr>
<td>M.S. Horticulture (thesis)</td>
</tr>
<tr>
<td>M.S. Plant Science (thesis)</td>
</tr>
<tr>
<td>M.S. Horticulture (non-thesis)</td>
</tr>
<tr>
<td>M.S. Plant Science (non-thesis)</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

- *Number of programs indicating they offered this type of program are indicate in this column.
- \*Mean number of students reported enrolled across institutions offering that particular degree program are indicated in this column.
- The plant science programs associated with these three values only under the TAMU Horticultural Sciences column represent the students adloced to the Department, but enrolled in interdisciplinary programs including genetics, molecular and environmental plant physiology, plant breeding, and food sciences.

<table>
<thead>
<tr>
<th>Table 3.3 Comparison of graduate enrollment in the TAMU Horticulture programs to the mean of 21 peer institutions reporting to the FAEIS database. CIP codes are as reported for undergraduate students.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peer Institution Average</strong> (21 peers reporting)</td>
</tr>
<tr>
<td>Masters Enrollment</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>2008</td>
</tr>
<tr>
<td>2009</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>2011</td>
</tr>
<tr>
<td>2012</td>
</tr>
</tbody>
</table>
Interestingly, the graduate program enrollment in the TAMU Department of Horticultural Sciences was opposite of this with a much greater proportion of the students enrolled in the degree programs in horticulture rather than the interdisciplinary programs listed in Table 3.2 in the plant science rows.

The largest reduction in graduate enrollment over last two decades within the Department has been at the expense of the number of Masters students (Fig. 3.1) and students enrolled in the interdisciplinary graduate degrees. This trend is likely to continue as potential changes to enrollment requirements for viable Ph.D. programs changes at the State Higher Education Coordinating Board level and Departments are forced to concentrate their resources in maintaining minimum graduation rates in their Ph.D. programs. Enrollment in the horticulture Ph.D. program within the Department has remained more stable in enrollment than the other graduate degree programs within the Department (Fig. 3.1, Table 3.3).

Figure 3.1 Enrollment in various degree programs offered through the TAMU Department of Horticultural Sciences from 1990 – 2012.

Compared to 2005, enrollment in land grant programs in horticulture at both the Ph.D. and Masters levels were similar to current levels, but enrollment in the horticultural emphasis in the more generalized plant science programs has increased (Arnold et al., 2005). Although the proportions are still small, the enrollment in non-thesis horticulture Masters programs has increased compared to 2005 levels (Arnold et al., 2005). When “other” was listed, it was frequently mentioned as either non-degree seeking students or those in some sort of post-graduate certificate program.

No responding institutions offered a Ph.D. program in horticulture or with a horticulture concentration at a distance. The TAMU Department of Horticultural Sciences does participate in a new plant breeding interdisciplinary degree in cooperation with the TAMU Department of Soil and Crop Sciences that is offered at a distance, but this program is so new it has no graduates yet. Six Masters level programs in horticulture or in plant science with a horticulture emphasis were offered at a distance, four by land grant schools and two by non-land
grant schools. Only one institution offered a thesis option M.S. in plant science with a horticultural emphasis at a distance, all other available Masters programs were non-thesis degrees. Participation in distance courses within in residence programs was still done by a minority of students, but appeared to be a growing course option compared to the previous horticulture graduate program survey (Arnold et al., 2005). Participation in courses offered at a distance average from 10.7% for non-thesis M.S. programs to 16.5% of thesis requiring M.S. programs.

Graduate programs in horticulture produce few degree candidates on an annual basis, ranging between 3 and 5 students at both the Masters and Doctorate levels (Table 3.4). The problematic issue in that regard at Texas A&M is that the Texas Higher Coordinating Board requires a minimum of 10 doctoral degrees be awarded over a 5 year period for all doctoral programs. Programs below that level are labeled “low producing” programs and are subject to elimination. An additional complication is the fact that the THECB is actively considering raising the minimum production to 15 degrees/5 years, and if that happens, the doctoral degree in horticulture would be in the “low producing” category.

<table>
<thead>
<tr>
<th>Peer Institution Average (# peers reporting)</th>
<th>TAMU Horticulture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters Degrees (20)</td>
<td>Doctorate Degrees (19)</td>
</tr>
<tr>
<td>2007</td>
<td>3.6</td>
</tr>
<tr>
<td>2008</td>
<td>4.3</td>
</tr>
<tr>
<td>2009</td>
<td>4.7</td>
</tr>
<tr>
<td>2010</td>
<td>4</td>
</tr>
<tr>
<td>2011</td>
<td>4.9</td>
</tr>
<tr>
<td>2012</td>
<td>3</td>
</tr>
</tbody>
</table>

More than half of both land grant (57.1%) and non-land grant (66.7%) units permitted direct admission to Ph.D. programs without a prior M.S. degree. However, all (100%) of the land grant programs required the identification of a faculty member willing to serve as the student's advisor prior to admitting the student to the program. A majority (60.0%) of non-land grant schools also required that a faculty advisor be identified prior to admitting the student. No schools reported using a lab rotation system during admissions procedures for either land grant or non-land grant horticulture graduate programs. A majority (60.0%) of non-land grant schools indicated other admissions criteria, with a visible means of support being mentioned.

Admissions criteria were fairly consistent across programs with 100% of both non-land grant and land grant schools including prior grade point averages or ratios in the process. All (100%) programs included an English language proficiency measure for international students who's native language was not English. Recommendation letters were required by 100% of land grant programs and 80.0% of non-land grant institutions.

Nearly all (95.5 %) land grant schools considered GRE scores in the admissions process and the majority (60.0) of non-land grant schools also incorporated GRE scores in the matrix of admissions criteria. None of the responding institutions reported any specialized entrance examinations beyond the GRE. Several (40.9%) of the land grant schools indicated other criteria were also involved in the admissions process with an essay or statement of purpose being the most frequently cited measure. No additional criteria were indicated by non-land grant schools. The Texas A&M University Department of Horticultural of Horticultural Sciences includes all of the above criteria except a specialized admissions exam in determining admission to our programs.
Demographics of Students in Graduate Horticulture Degree or Concentration Programs

Domestic students constituted the majority of the enrollment in both land grant and non-land grant programs, but domestic students (65.2%) were a smaller majority of the population than in non-land grant programs (80.6%) with international students making up 34.8% of the land grant horticulture graduate students versus only 19.4% at non-land grant schools. Interestingly, the proportion of domestic versus international students has remained nearly unchanged since the 2005 survey (Arnold et al., 2005). The TAMU Department of Horticultural Sciences has an even greater international representation (46%) to our student body with only 54% domestic graduate students. The largest ethnic population of students in the survey was non-Hispanic whites (Caucasian) at both land grant (63.6%) and non-land grant (75.0%) programs.

The TAMU Department of Horticultural Sciences had a minority non-Hispanic white population (42%) when all domestic and international students were considered (Table 3.5). The second largest ethnic/racial group at land grant schools (14.0%) was Asian (other than Indian/Pakistani) and was tied for second most populous in non-land grant schools at 9.0%. At non-land grant schools Indian/Pakistani student enrollment (9.0%) was tied for second, but this was only 4.9% of students at land grant schools. At land grant schools the third most frequent ethnic/racial group was Hispanics (6.9%) while this was only the sixth largest group at non-land grant schools (1.3%). Hispanics were the second largest group of domestic students at the TAMU Department of Horticultural Sciences. Black students represented 3.0% of students at land grant schools, but only 2.3% of student in non-land grant degree programs. Black enrollment at 1862 land grant horticulture programs has remained steady since 2005, while that at non-land grant schools has declined substantially (Arnold et al., 2005), perhaps due to the fact that none of the 1890 land grant schools responded to the current survey (Table 3.1) whereas several did respond to the 2004 survey (Arnold et al., 2005). Native American enrollment was small in both groups, but greater (2.5%) in non-land grant institutions than in land grant (0.3%) programs. Native American enrollment has increased from nearly none at these types of institution in the 2005 survey (Arnold et al., 2005). The ethnic/racial category of other was not reported for non-land grant institutions, while it constituted 6.1% of the reported enrollment at land grant programs. Other was often noted to include those indicating no racial or ethnicity group or to include international students if they were not included in one of the other reported groups. Students of Arab or Middle Eastern decent were also a group noted under other by some institutions.

Financial Support of Students in Graduate Horticulture Degree or Concentration Programs

At land grant schools, on average 83.1% of graduate students received institutional support, whereas at non-land grant schools only 66.1% of graduate students were funded (Table 3.6). The largest single funding source for students was research assistantships, particularly at land grant institutions. Research grants were often mentioned by participants as funded by grants rather than internal institutional dollars.

At the TAMU Department of Horticultural Sciences research assistantships are the predominant funding source at 77.0 % of the students, of which 100% is from soft money (grants contracts, temporary bridge funds, other external funds, etc.). The second largest source of funding for graduate students was teaching assistantships for
non-land grant schools (Table 3.6). While teaching only assistantships constituted a smaller proportion of funding sources for graduate students at land grant schools, when merged with combined responsibility assistantships, the proportionate funding source (17.0%) was similar to that of teaching assistantships at non-land grant schools (17.4%).

Teaching assistantships at the TAMU Department of Horticultural Sciences was also about 17% (our only hard money assistantship source). Although a relatively small proportion of the overall funding, fellowships were about twice as much of the funding sources at land grant schools as at non-land grant schools (Table 3.6). On average, both land grant and non-land grant institutions had about 5% of the horticulture graduate students funded by their home (non-U.S.) country (Table 3.6). The TAMU Department of Horticultural Sciences currently has no students funded by their home countries. Approximately 12% of the fulltime TAMU Department of Horticultural Sciences graduate students were not funded in Fall 2012, with a few additional non-funded part-time students. This was within a few percent of the mean for land grant schools (Table 3.6). The proportion of non-funded students increased at non-land grant schools compared to 2005, but decreased for land grant institutions over the same time span (Arnold et al., 2005).

Mean fellowship stipends at land grant institutions ranged from a mean minimum of $19,265 to a mean maximum of $21,160. These stipends have increased substantially in comparison to those offered by both types of schools in 2005 (Arnold et al., 2005). The greater value of fellowships is not surprising as they are frequently used to lure top candidates to the positions. Absolute minimum / maximum ranges for fellowship stipends were from $1,100 to $40,000 encompassing the widest range of variation in stipends for any of the sources of funding. Research assistantship stipends had an absolute range of $4,368 to $31,000 per year while teaching stipends had an absolute range of $6,825 to $26,700. Assistantship stipends typically ranged at land grant institutions from a mean minimum research stipend of $16,568 to a mean maximum extension assistantship stipend of $23,440 (Table 3.7). Our Departmental minimum assistantship stipend average of $16,500 ($16,000 Masters, $17,000 Ph.D.) is comparable to the land grant mean minimum assistantships.

### Table 3.6. Graduate student funding (by source) at landgrants and state/province institutions in horticulture.

<table>
<thead>
<tr>
<th>Category</th>
<th>Landgrant (%)</th>
<th>State/province (%)</th>
<th>TAMU HORT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fellowships</td>
<td>7.5</td>
<td>3.0</td>
<td>0</td>
</tr>
<tr>
<td>Teaching Assistantships</td>
<td>8.3</td>
<td>17.4</td>
<td>17</td>
</tr>
<tr>
<td>Research Assistantships</td>
<td>60.7</td>
<td>44.8</td>
<td>77</td>
</tr>
<tr>
<td>Extension Assistantships</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Combination Assistantships</td>
<td>8.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Home Country</td>
<td>5.0</td>
<td>5.5</td>
<td>0</td>
</tr>
<tr>
<td>None/self-funded</td>
<td>11.9</td>
<td>28.4</td>
<td>12</td>
</tr>
</tbody>
</table>

### Table 3.7 Value of graduate stipends by type in horticulture programs from a 2013 national survey.

<table>
<thead>
<tr>
<th>Funding type:</th>
<th>1862 Landgrants</th>
<th>State/province</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum ($/year)</td>
<td>Maximum ($/year)</td>
</tr>
<tr>
<td>Fellowships</td>
<td>$19,265&lt;sup&gt;y&lt;/sup&gt;</td>
<td>$21,160</td>
</tr>
<tr>
<td>Teaching assist</td>
<td>$16,863</td>
<td>$18,343</td>
</tr>
<tr>
<td>Research assist.</td>
<td>$16,568</td>
<td>$21,349</td>
</tr>
<tr>
<td>Extension assist.</td>
<td>$19,429</td>
<td>$23,380</td>
</tr>
<tr>
<td>Combination assist.</td>
<td>$16,728</td>
<td>$18,678</td>
</tr>
</tbody>
</table>

<sup>y</sup>Values represent means of those reported at individual institutions

### Table 3.8 Tuition/fees.

<table>
<thead>
<tr>
<th>Tuition/fees</th>
<th>In-state</th>
<th>Out-of-state</th>
<th>In-state</th>
<th>Out-of-state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost/year</td>
<td>$10,227&lt;sup&gt;y&lt;/sup&gt;</td>
<td>$18,963</td>
<td>$10,103</td>
<td>$15,204</td>
</tr>
</tbody>
</table>

<sup>y</sup>Values represent means of those reported at individual institutions
The lowest minimum research assistantship offered was $4,368, while the greatest was $26,700. Non-land grant institutions offered substantially lower mean minimum assistantship stipends in teaching and research, especially with teaching assistantships (Table 3.7). Time commitments for fellowships were lower than for most assistantship classes, with most assistantships requiring in the range of 10 to 20 hours of service.

Remuneration in the form of stipends was offered by 95.5% of land grant programs and 80.0% of non-land grant programs. In addition, 95.5% of land grant programs provided out of state tuition waivers, with 60.0% of non-land grant programs following suit. A vast majority (90.9%) of land grant programs offered in-state tuition waivers, whereas only a minority (40.0%) of non-land grant programs offered in-state tuition waivers. Most (59.1%) land grant programs offered medical insurance but only 20.0% of non-land grant programs provided it. Few land grant (13.6%) or non-land grant (20.0%) institutions also paid student fees. Other forms of remuneration were provided by 4.5% of land grant programs, but no non-land grant programs offered additional benefits.

Mean yearly costs of in-state tuition were similar at land grant ($10,227) compared to non-land grant institutions ($10,103) (Table 3.7). However, out-of-state tuition was on average considerably greater ($18,964) at land grant institutions than at non-land grant institutions ($15,204). Teaching assistantships in-state ($6,348) and out-of-state ($12,666) tuition are considerably below the means for land grant institutions. However, for the majority of schools offering out-of-state and in state tuition waivers, this may nearly double the cost of funding a student compared to the actual amount of the stipend. Along with the cost of health insurance, social security, etc. the cost can easily be $30,000 or more per year to the Department or principal investigator.

One phenomenon this has created is that it is often more cost effective to hire a technician or post-doc than to hire graduate students. Considering a mean stay of 3.9 (with prior M.S.) to 4.6 (without prior M.S.) years for Ph.D. students these numbers can easily translate into an investment of well over a $100,000 in just direct salary and benefits for a single Ph.D. student, not including the costs of actually conducting the experiments, travel to meetings for presentations, etc. Ph.D. programs took a similar 3.5 and 5.0 years time frames, respectively, at non-land grant schools. Master of Science degrees took a mean of 2.4 years at land grant and 2.1 years at non-land grant institutions. Times were nearly reversed for non-thesis Masters programs at land grant schools which were completed more quickly, with a mean of 2.1 years, while at non-land grant schools non-thesis Masters programs took longer, 2.5 years. Mean time to completion for students with a prior M.S. at the TAMU Department of Horticultural Sciences was 3.7 years, slightly below the mean for other land grant institutions.

![Figure 3.2. Actual assistantship budget and consumer price index (CPI) adjusted budget based on 1999 U.S. dollars.](image)
Hard money funded assistantships from internal institutional support remains at the same absolute dollar amount in the TAMU Department of Horticultural Sciences as it was in 2002 at approximately $100,379 per year (Fig. 3.2). Applying the consumer price index calculations to the hard money graduate assistantship funds, this amount has steadily eroded to an adjusted value of $78,653.

Compounding the eroding value of the funds is the need to increase stipend levels which has resulted in a loss of about one-third of our previously available assistantship slots (Fig. 3.3). The only saving factor was the provision of in-state tuition waivers for all internally funded Ph.D. and most internally-funded Masters students beginning in 2005. Unfortunately, these in-state tuition waivers do not apply to students who are funded on external funds, so this must be factored into grant requests, possibly decreasing the likelihood of the grant being funded.

Figure 3.3. Available teaching assistantships based on hard money budgeted funds divided by the mean minimum assistantship stipend in effect at that date.

Course Requirements and Experiential Learning in Graduate Horticulture Degree or Concentration Programs

Total course and credit hour requirements were slightly greater at land grant institutions for horticulture concentrations within a plant science program than in horticulture only degree programs, however minimum research hours requirements were slightly greater in the Ph.D. in horticulture programs (Table 3.8). Ph.D. programs at non-land grant schools required on average fewer total credit hours and fewer research/internship
hours, but far more formal course work hours (Table 3.8). Requirements were surprisingly uniform among thesis requiring M.S. in horticulture and M.S. in plant science with emphasis in horticulture programs, varying only slightly in requirements within a given category of courses (Table 3.8). A similar degree of uniformity was present for most categories of requirements for non-thesis Masters programs, with the exception of research or internship hours which were much greater in land grant than in non-land grant non-thesis Masters programs in plant science with a horticulture concentration (Table 3.8). When available, on-line degrees were reported by all institutions to have the same requirements as in residence degrees.

<table>
<thead>
<tr>
<th>Degree</th>
<th>Requirement</th>
<th>Land grant (#)</th>
<th>State / Province (#)</th>
<th>TAMU Hort. Sci. (#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D. Horticulture</td>
<td>Total hours</td>
<td>66.5</td>
<td>-----</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Formal courses</td>
<td>28.5</td>
<td>-----</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Research/internship</td>
<td>28.0</td>
<td>-----</td>
<td>20</td>
</tr>
<tr>
<td>Ph.D. Plant Science</td>
<td>Total hours</td>
<td>73.8</td>
<td>60.0</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Formal courses</td>
<td>37.3</td>
<td>51.0</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Research/internship</td>
<td>26.4</td>
<td>9.0</td>
<td>-----</td>
</tr>
<tr>
<td>M.S. Hort. (thesis)</td>
<td>Total hours</td>
<td>30.1</td>
<td>34.5</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Formal courses</td>
<td>20.6</td>
<td>24.0</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Research/internship</td>
<td>7.8</td>
<td>9.0</td>
<td>10</td>
</tr>
<tr>
<td>M.S. Plant Science (thesis)</td>
<td>Total hours</td>
<td>30.2</td>
<td>33.0</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Formal courses</td>
<td>19.4</td>
<td>23.5</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Research/internship</td>
<td>8.1</td>
<td>9.5</td>
<td>-----</td>
</tr>
<tr>
<td>M.S. Hort. (non-thesis)</td>
<td>Total hours</td>
<td>32.3</td>
<td>36.5</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Formal courses</td>
<td>29.3</td>
<td>32.0</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Research/internship</td>
<td>3.0</td>
<td>4.3</td>
<td>3</td>
</tr>
<tr>
<td>M.S. Plant Science (non-thesis)</td>
<td>Total hours</td>
<td>33.0</td>
<td>36.5</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Formal courses</td>
<td>29.0</td>
<td>36.0</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Research/internship</td>
<td>7.7</td>
<td>0.0</td>
<td>-----</td>
</tr>
</tbody>
</table>

All values are converted to semester hours. The total hours represent that required presuming the student already holds a Masters degree. Note that formal and research/internship hours do not equal the total hours as these represent minimum requirements in those areas and some programs leave a large proportion of the credit hours flexible at the graduate committee’s discretion. Where available on-line degrees had the same requirements as in residence.

Emphasis on high impact or experiential learning has increased recently in undergraduate programs at Texas A&M University and so we were interested in documenting some of these activities required in horticulture graduate programs. The surveyed institutions were asked to indicate whether additional experiences beyond normal classes were required in areas other than research, specifically teaching, extension/outreach, internships, or other. Teaching experiences were the only experiential learning requirement for most horticulture graduate degrees outside of the typical research experiences for most programs (Table 3.9). Aside from teaching experiences, only internships in M.S. non-thesis programs at land grant institutions were required by more than 10% of the programs as additional experiential learning requirements among horticulture graduate programs (Table 3.9).
Table 3.9. Experiential learning requirements for horticulture graduate programs beyond the normal research experiences required for thesis or dissertation based programs.

<table>
<thead>
<tr>
<th>Experience</th>
<th>Ph.D.</th>
<th>M.S. (thesis)</th>
<th>M.S. (non-thesis)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Land</td>
<td>State / Grant</td>
<td>Land</td>
</tr>
<tr>
<td></td>
<td>Grant</td>
<td>province (%)</td>
<td>Grant</td>
</tr>
<tr>
<td>Teaching</td>
<td>41.0z</td>
<td>0.0</td>
<td>36.3</td>
</tr>
<tr>
<td>Extension</td>
<td>9.1</td>
<td>0.0</td>
<td>9.1</td>
</tr>
<tr>
<td>Internship</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Other</td>
<td>4.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

*Percentage of institutions requiring experiential learning in this area in addition to basic course work or thesis / dissertation research.

Graduate Program Metrics Employed in Evaluation of Horticulture Degree or Concentration Programs

Increasing scrutiny of educational programs for accountability at all levels has led to strong motivations for the development of evaluative metrics to determine the efficacy of graduate programs in meeting institutional goals. A variety of metrics are being employed at various institutions and the emphasis placed on these metrics likely differs among institutions and perhaps over time within an institution. Ten metrics commonly mentioned to us in preliminary conversations were included in the survey (Table 3.10). A category of other with encouragement to write in the measure(s) under other was also included.

Table 3.10. Ranking of selected program metrics among 1862 land grant programs and state or provincial non-land grant programs by which horticultural graduate programs perceive themselves to be evaluated.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Land grants</th>
<th>State / provincial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of graduate students</td>
<td>4.2**</td>
<td>4.3**</td>
</tr>
<tr>
<td>Number of Ph.D. students</td>
<td>3.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Peer reviewed publications</td>
<td>2.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Student awards</td>
<td>1.9</td>
<td>3.3</td>
</tr>
<tr>
<td>Student scientific presentations</td>
<td>1.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Course/student contact hours</td>
<td>1.1</td>
<td>2.5</td>
</tr>
<tr>
<td>GRE entrance scores</td>
<td>0.9</td>
<td>1.8</td>
</tr>
<tr>
<td># Graduate courses taught</td>
<td>0.8</td>
<td>3.3</td>
</tr>
<tr>
<td>Students involved in teaching</td>
<td>0.7</td>
<td>2.0</td>
</tr>
<tr>
<td>Students’ GPR/GPA</td>
<td>0.5</td>
<td>2.8</td>
</tr>
<tr>
<td>Other z</td>
<td>1.2</td>
<td>0.0</td>
</tr>
</tbody>
</table>

*Greater number within the column indicates greater importance in metrics. Highest ranked metric was keyed as a five to lowest ranked keyed in the analysis as a one. Unranked metrics were assigned a zero weight for that evaluator. The mean rank scores are presented.

*Values represent the mean proportion of the programs in which this metric was ranked within the top three metrics for a given program.

*Graduation rates and time to degree were most frequently commented under other.
Among land grant institutions the highest ranked metrics by far were the total number of graduate students enrolled in the program and secondarily the number of Ph.D. students enrolled in the programs (Table 3.10). These measures were also the most frequent metrics to appear in the top three metrics for a given land grant program. Two measures of student’s academic proficiency in the form of student publication of peer reviewed publications and student awards were the third and fourth ranked metrics, respectively, at land grant programs. These were also the next most frequently cited metrics in a given program’s top three metrics. The fifth and sixth highest ranked metrics were other and course or student contact hours, respectively. The two most frequently mentioned metrics under the other category by respondents that were not directly asked on the survey were graduation rates or numbers and time to degree completion. All other measures were ranked of low importance on average and were included in less than 15% of the units surveyed top three metrics. The relative importance of the various metrics seemed to be much more variable among institutions at non-land grant schools. The number of Ph.D. students and other category were of much less importance to non-land grant institutions than at land grant programs. Also, in contrast to land grant programs, non-land grant schools placed a much higher rank on the number of graduate courses taught, students’ involvement with teaching, students’ grade point averages or grade point rations, and GRE entrance scores (Table 3.10).

Learning Outcomes Assessment of the Graduate Program

Texas A&M University mandates that graduate programs be subjected to learning outcomes assessment in a manner analogous to the undergraduate academic program. To that end, departments were directed to develop assessment plans to address the following university level learning outcomes:

**University Masters Learning Outcomes**  
[http://catalog.tamu.edu/pdfs/Master'sOutcomes-1pg.pdf](http://catalog.tamu.edu/pdfs/Master'sOutcomes-1pg.pdf)

A student who graduates from Texas A&M University with a master’s degree will:
- Master degree program requirements, including
  - theories, concepts, principles, and practice;
  - develop a coherent understanding of the subject matter through synthesis across courses and experiences; and
  - apply subject matter knowledge to solve problems and make decisions.
- Use a variety of sources and evaluate multiple points of view to analyze and integrate information and to conduct critical, reasoned arguments.
- Communicate effectively.
- Use appropriate technologies to communicate, collaborate, conduct research, and solve problems.
- Develop clear research plans and conduct valid (data-supported), theoretically consistent, and institutionally appropriate research.
- Choose ethical courses of action in research and practice.

**University Doctoral Learning Outcomes**  
[http://catalog.tamu.edu/pdfs/DoctoralOutcomes-1pg.pdf](http://catalog.tamu.edu/pdfs/DoctoralOutcomes-1pg.pdf)

A student who graduates from Texas A&M University with a doctoral degree will:
- Master degree program requirements, including
  - theories, concepts, principles, and practice;
  - develop a coherent understanding of the subject matter through synthesis across courses and experiences; and
  - apply subject matter knowledge to solve problems and make decisions.
- Apply a variety of strategies and tools, use a variety of sources, and evaluate multiple points of view to analyze and integrate information and to conduct critical, reasoned arguments.
- Communicate effectively.
- Develop clear research plans, conduct valid, data-supported, theoretically consistent, and institutionally appropriate research and effectively disseminate the results of the research in appropriate venues to a range of audiences.
- Use appropriate technologies to communicate, collaborate, conduct research, and solve problems.
- Teach and explain the subject matter in their discipline.
- Choose ethical courses of action in research and practice.
Departmental assessment plans are reviewed by a committee of peers and administrators at the College-level and evaluated for compliance with reporting guidelines. The Horticultural Sciences graduate program assessment was found to be “under development,” indicating that it needs to be revised to be in full compliance. Several of the University level outcomes are not assessed by our measures.

**Departmental Ph. D. Program Learning Outcomes Assessment Plan**

The Ph.D. program in horticulture exists to provide an advanced science-based education for students through teaching and directed horticultural research experience.

**Outcomes**

- **Outcome 1.** Graduates will have an understanding of the scientific method, statistical methodology, and ability to apply these to solving horticultural research problems
- **Outcome 2.** Graduates will be able to find, critically evaluate, and communicate, both orally and written; plant science literature and the results of horticultural research.
- **Outcome 3.** Graduates will develop strong problem-solving and management skills related to research and development

**Measures**

- Research proposal (outcome assessed, 1)
  Timely (12-24 months) and successful completion of research proposal
- Dissertation (outcome assessed, 1)
  Timely (36-48 months) and successful presentation (exit seminar) and defense of thesis.
- Presentations (outcome assessed, 2)
  Presentations of research study in meetings: Scientific Meetings, Student Research Week, Industry, etc.
- Publications non-refereed (outcome assessed, 2)
  Publications accepted in non-referred journals or magazines. Abstracts are included in this category.
- Publications refereed (outcome assessed, 2)
  Publications in referred journals.
- Recognition (outcome assessed, 2)
  Awards for presentations at scientific meetings, intercollegiate awards, departmental recognition.
- Employment (outcome assessed, 3)
  At this point in the assessment this objective is to gather information to see what targets and actions plans are feasible. One possibility is the target of 75% job placement upon graduation from the program.

**Masters of Agriculture Learning Outcomes**

The Masters of Agriculture degree program exists to provide an advanced education for students through teaching and directed horticultural research experience- in the form of internships.

**Outcomes**

- **Outcome 1.** Graduates will have proper exposure and experience involving assessment of horticultural problem solving. They should have understanding regarding scientific method, statistical methodology, and experience solving horticultural problems as it relates to their specific field of horticulture.
- **Outcome 2.** Graduates will be able to find, critically evaluate, and communicate, both orally and written; plant science literature and the results of horticultural research and experiences as it relates to their specific field in horticulture
- **Outcome 3.** Graduates will develop strong problem-solving and management skills related to industry, research, horticultural experiences.

**Measures**

- Internship (outcome assessed, 1)
  Completed Horticultural Internship
- Professional paper (outcome assessed, 1)
  Student's completion of their professional paper regarding a critical analysis of their internship opportunity and experience.
- Presentations (outcome assessed, 1, 2)
Presentation of internship responsibilities, experiences, learning targets to department

- Publications (outcome assessed, 1, 2)
  Publication in consumer magazine, extension newsletter, newspaper, etc.
- Employment (outcome assessed, 1, 3)
  Employment in industry leadership position.

**Masters of Science Learning Assessment Plan**

The Masters of Science degree program exists to provide an advanced science-based education for students through teaching and directed horticultural research experience.

**Outcomes**

- Outcome 1. Graduates will have an understanding of the scientific method, statistical methodology, and ability to apply these to solving horticultural research problems
- Outcome 2. Graduates will be able to find, critically evaluate, and communicate, both orally and written; plant science literature and the results of horticultural research.
- Outcome 3. Graduates will develop strong problem-solving and management skills related to research and development

**Measures**

- Research proposal (outcome assessed, 1)
  Timely (12-18 months) and successful completion of research proposal
- Thesis (outcome assessed, 1)
  Timely (24-36 months) and successful presentation (exit seminar) and defense of thesis.
- Presentations (outcome assessed, 2)
  Presentations of research study in meetings: Scientific Meetings, Student Research Week, Industry, etc.
- Publications non-refereed (outcome assessed, 2)
  Publications accepted in non-referred journals or magazines. Abstracts are included in this category.
- Publications refereed (outcome assessed, 2)
  Publications in referred journals.
- Recognition (outcome assessed, 2)
  Awards for presentations at scientific meetings, intercollegiate awards, departmental recognition.
- Continuation (outcome assessed, 2)
  Number of graduates that go on to a Ph.D. program.
- Employment (outcome assessed, 3)
  Employment in academic, industry research/education/leadership positions.

We recognize that we need to improve our assessment data collection and interpretation. To that end four processes have been initiated to revise/refine our graduate program learning objectives. First, a series of graduate faculty meetings have been initiated to revise our graduate program policy manuals and to bring them up to date and in compliance with University and College. Second, after recognizing that we were having difficulty accumulating key progress and achievement data on our graduate students, we put in place an annual review system for each graduate student, a copy of which is included as Fig. 3.4.
Third, we will support and ask our faculty and students to participate in a new series of evaluation instruments to be administered upon completion of the final defense for their degrees that will capture additional information needed for program assessment (Fig. 3.5). Fourth, we have conducted the current study to determine how our program compares with its sister programs at other institutions and to determine what programmatic metrics are being applied at other institutions. As these data become available, our intention is to form a new assessment committee for the graduate program to recommend revisions to the learning outcomes and objectives in light of what we have learned about our program and that of our peer institutions.
Figure 3.5. Graduate student performance assessment form to be used at final exam.

Demographics and Remuneration of Faculty in Graduate Horticulture Degree or Concentration Programs

Although departments were larger in land grant institutions than in non-land grant schools, the distribution of faculty among ranks was similar at both types of institutions (Table 3.11). The one difference was a slightly smaller proportion of professors at non-land grant schools and a bit greater proportion of lecturers, but these differences were minor. The largest sector of faculty are the Professors, with Associate Professors constituting the second largest proportion. The typical faculty consisted of 32.7 members at land grant schools, but was smaller at non-land grant schools with an average of 21.2 members. Professorial rank faculty made up 95.4\% of the faculty at land grant schools. Most of these faculty were at mid to late career stages (Professor and Associate Professors). Early career stage faculty (Assistant Professors) consisted of only 18.3 to 18.9\% of the faculty at land grant and non-land grant institutions, respectively. This suggests that the horticulture faculty is an aging population. Our faculty at the Texas A&M University Department of Horticultural Sciences is even more senior as we have no Assistant Professors in our on campus teaching/research positions, and only three extension specialists and one off-campus researcher who are Assistant Professors. Presuming a level or increasing number of positions in horticulture programs in the future, this would suggest that there would be an increase in the demand for new Ph.D. students in the coming years as this aging population reaches retirement ages.
Table 3.11. Distribution of faculty by rank in North American land grant and non-land grant universities which offer graduate programs in horticulture or emphasis in horticulture within plant science graduate programs.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Land grant (# / unit)</th>
<th>Land grant (% in unit)</th>
<th>State / Province (# / unit)</th>
<th>State / Province (% in unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>15.9(^y)</td>
<td>48.6(^z)</td>
<td>9.3(^y)</td>
<td>43.9(^z)</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>9.0</td>
<td>27.5</td>
<td>6.3</td>
<td>28.3</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>6.3</td>
<td>18.3</td>
<td>4.0</td>
<td>18.9</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>1.0</td>
<td>3.1</td>
<td>0.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Lecturer</td>
<td>0.5</td>
<td>1.5</td>
<td>0.8</td>
<td>3.8</td>
</tr>
</tbody>
</table>

\(^y\)Values within a column represent mean number of faculty at a given rank.
\(^z\)Values within a column represent mean percentage of the total unit’s faculty at a given rank.

Most (66.5%) of the faculty at land grant schools are still in full year (11/12 month) appointments, while slightly more than half (54.3%) of faculty at non-land grant schools were in similar appointments. Most of the remaining faculty (19.3% land grant, 32.5 % non-land grant) were in academic year (9/10 month) appointments with the opportunity to obtain external summer funding. A small proportion of the faculty were in academic year appointments with internal sources of summer funding, 4.0% for land grant schools and 13.2 % for non-land grant programs. The remaining were on academic year appointments with no options for summer funding internally or externally through the universities, 8.4% at land grant units and 9.3% at non-land grant programs.

One of the most surprising changes in salary structures from the 2005 survey (Arnold et al., 2005) to present is that the salaries for senior faculty (Professors and Associate Professors) at non-land grant schools have gone from trailing those of their land grant counterparts to surpassing them in the current survey (Table 3.12). Salaries at the Assistant Professor level were similar at both types of institutions. Salaries for lecturers at non-land grant schools lagged behind those of their land grant counterparts which was a similar situation as in the 2005 survey.

Table 3.12. Faculty salaries at surveyed 1862 land grant and state/provincial universities in units with horticulture degree programs. All salaries were asked to be submitted at a full year 12 month basis for equal comparisons.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Means reported for land grants</th>
<th>Means reported for state/provincial units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum ($/yr)</td>
<td>Average ($/yr)</td>
</tr>
<tr>
<td>Professor</td>
<td>94,349</td>
<td>116,028 (^z)</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>79,129</td>
<td>91,105</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>75,923</td>
<td>80,570</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>69,337</td>
<td>75,030</td>
</tr>
<tr>
<td>Lecturer</td>
<td>50,283</td>
<td>53,280</td>
</tr>
</tbody>
</table>

\(^z\)Mean average and in particular mean maximum salaries are probably under estimated as several schools noted that their data did not include unit head or other administrators salaries in their reported figures.

Salaries in the TAMU Department of Horticultural Sciences on the whole are below the national averages (compare Tables 3.13 and 3.12). The average salaries of the professors was slightly above that of professors at peer institutions (both landgrants and state/provincial institutions), but associate and assistant professors were both below the peer average. Direct comparison of faculty compensation is complicated by the fact that some of our faculty are on 10 month appointments and contribute two months salary from grants and contracts. The data we report is only the budgeted salary exclusive of any supplement from grants or contracts. While we do have faculty in lecturer positions, we have only one individual at each rank so those salaries cannot be reported without...
listing the person’s salary. The national survey did not include an equivalent to the program specialist position, a rank that is exclusive to some of our Texas A&M Agrilife Extension personnel.

The Department faces several challenges regarding faculty salaries: first is in light of essentially flat or decreasing take-home pay for the past four years, how do we reward and retain top performers? Secondly, salary compression is impacting several of the senior faculty. Both of these issues have the potential to seriously impact morale and retention. The wide disparity in senior faculty salaries further contributes to these potential morale issues. The threat of forced compression to fewer month appointments with subsequent loss of salary, as has occurred in several of sister Departments in the College, further complicates the problem and would likely impact the more senior faculty who were hired on mostly 12 month appointments more so than the less senior faculty who have been increasingly hired on 9/10 month appointments over recent years. Another alarming trend is the provision of salary increases as merit pay only, with the increases awarded as either “add to base” or “one time” adjustments. A relatively high “one time” adjustment (as was provided to many of our high performing full professors for FY2013) does not permanently alter the individual’s base salary since it is the equivalent of a one-time bonus. Over time, salaries erode as the cost of living increases.

Overall the TAMU Department of Horticultural Sciences graduate program is similar to or slightly larger than that of our peer institutions. Although internal support funds have drastically eroded over recent years, the enrollment of Ph.D. students in the horticulture degree program remains strong and there is evidence to suggest that there will be increasing demand for graduates in the future. Faculty have been successful at mentoring quality students as evidenced by their awards and frequent placement in faculty positions soon after graduation.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Lowest ($/yr)</th>
<th>Highest ($/yr)</th>
<th>Average ($/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>86,173.00</td>
<td>170,001.00</td>
<td>126,358.15</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>63,634.00</td>
<td>99,659.00</td>
<td>87,725.00</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>74,256.00</td>
<td>81,456.00</td>
<td>77,237.33</td>
</tr>
<tr>
<td>Program Specialist</td>
<td>40,378.00</td>
<td>70,380.00</td>
<td>55,043.25</td>
</tr>
</tbody>
</table>
4. OVERVIEW OF THE TEXAS AGRILIFE EXTENSION SERVICE HORTICULTURE PROGRAM

Extension Horticulture has been reduced in size during the last decade. Programmatically, the unit currently consists of 45 professionals, including: 16 Extension Specialists/Program Specialists, 20 County Extension Agent – Horticulture positions, an Extension Assistant, a Web Administrator, and 6 partially Extension-funded support staff professionals.

Extension Horticulture Banner Programs

**Small Acreage Horticultural Crop Outcome Program** – Extension horticulturists with food and nursery crop production expertise have combined efforts to create a Small Acreage Horticultural Crop Outcome Program for implementation by CEAs. In 2009, a Website was established including 9 online training modules and 32 crop guides/budgets. An outcome evaluation instrument was designed for use by CEAs and specialists. Webinars and face-to-face educational events are conducted. Outcome evaluation data for educational events and online materials are tabulated and stored in the Aggie Horticulture database and reported via the TExAS Reporting and Strategic Plan System. Educational events with outcome evaluation metrics conducted include the Pecan and Fruit Orchard Management Short Courses and the Nursery Management and Marketing Webinars.

**Earth-Kind® Environmental Stewardship** – Extension Horticulture specialists continue to serve as educational and programmatic resources for CEAs by adopting Earth-Kind® Environmental Stewardship as a unit-wide program. Extension specialists and CEAs have developed and implemented Earth-Kind® outcome plans to obtain program impacts measuring knowledge gained, intent to adopt practices, and anticipated economic impacts. Evaluation data are stored in a database within the Aggie Horticulture Website and reported via the TExAS Reporting System. Earth-Kind programs include multiple Earth-Kind landscape workshops during 2013, an Earth-Kind short course held in College Station in December, 2012, and the delivery of Earth-Kind training materials and publications through Aggie Horticulture.

**Junior Master Gardener® (JMG) Program** – Created, trademarked, and administered within the Department, this international youth gardening 4-H program enrolls more than 200,000 Texas children annually (representing 1/5 of Texas 4-H annual enrollment) through over 300 registered groups. The program continues to expand with JMG groups in all 50 states; 36 land-grant universities are registered/licensed JMG program partners; and 10 foreign countries, from Guatemala, Honduras, to South Korea, have JMG programs. Much focus in 2013 will be toward activities associated with the $5 million USDA-AFRI grant secured by an interdisciplinary team led by Judy Warren and Lisa Whittlesey. The title of the grant is "Using Family Focused Garden, Nutrition and Physical Activity Programs to Reduce Childhood Obesity."

**Texas Master Gardener™ Program** – The Texas program continues to be the largest Master Gardener program in the nation with over 5,164 Master Gardeners contributing over 454,942 hours of volunteer service. This service equates to 112 full-time employees and an economic benefit of $10.5 million to the citizens of Texas. In 2013, a new volunteer reporting system will be implemented to more accurately document the service of the Master Gardeners.

**Aggie Horticulture® Website** – Aggie-Horticulture.tamu.edu remains the most accessed Website in Texas A&M AgriLife, serving over 6 million unique visitors, 9.7 million user sessions, and 39.4 million page views for the time period of January 1, 2012 – December 31, 2012. Much time, effort, and expertise is required to actively manage and continually update the site. Aggie Horticulture contains over 100,000 documents providing Internet access to every topic in the art and science of horticulture. Of the 171 Websites reporting to the Texas AgriLife Extension Web Stats database system, Aggie Horticulture served 58% of the total pages viewed and 57% of the total unique visitors of AgriLife Extension Websites during the past fiscal year. According to the Alexa Traffic Rankings, for the past 6 months, Aggie Horticulture is the 3rd most active Website in the tamu.edu domain serving 68.7% of all traffic across websites in the domain. Aggie Horticulture is...
also the number two Website under the category of Horticulture (out of 679 sites) and the number ten Website in the overarching category of Agriculture (out of 3378 sites) worldwide, according to Alexa Traffic Ranking.

**Commercial Horticulture Outreach** – Extension Horticulture educational programs and applied research serve horticultural food crop production and the green industries. Regularly scheduled educational events include the Pecan Orchard Management Short Course, Better Process Control School, Great Vineyards Program, Pierce’s Disease Symposium, and High Plains Vegetable Conference.

**Significant Individual Accomplishments for 2012**

Bill Welch published 12 articles in the Texas issue of Southern Living Magazine (600,000 readership) as well as one article (August) for the entire Southern Living readership which is about 7 million readers. He also published Heirloom Gardening in the South, 7000 copies, and completed a new edition of Perennial Garden Color, 50,000 copies.

Lisa Whittlesey led the Junior Master Gardener program in working with academic, community, and governmental partners to develop, implement, evaluate, and disseminate two Extension-developed interventions for 3rd graders: 1) the Junior Master Gardener (JMG) curriculum, and 2) Walk Across Texas (WAT). The research was organized as a group-randomized factorial design with four conditions: Coordinated School Health (CSH) alone, CSH with JMG, CSH with WAT, and CSH with both JMG and WAT). Initial pilot testing for the research project was conducted during the fall and spring of 2011-12 at Evans Elementary in Corpus Christi, TX. The pilot study results indicate that an increase in fruit and vegetable intake, decrease in sugar sweetened beverages, increased gardening activities with families at home, and ability to reduce the number of children classified as overweight or obese was due to the JMG and WAT curriculum.

Juan Anciso’s most significant accomplishment in 2012 was being a grants review panel member for the USDA-SCRI grants in Washington D.C. The grants panel consists of 15 individuals mainly researchers from various universities and some horticulture industry participants. However, he was the only full-time Extension representative on this grants panel that reviews multi-million dollar grants.

Russ Wallace’s accomplishments for 2012 included two manuscripts published from his efforts with a Specialty Crops Research Initiative grant and a multi-state high tunnel project; one in HortScience, *Deterioration of potentially biodegradable alternatives to black plastic mulch in three tomato production regions* and another in HortTechnology, *Lettuce yield and quality when grown in high tunnel and open-field production systems under three diverse climates*. The HortTechnology manuscript was also selected by ASHS for publication as a ‘press release’ on their website.

In 2012 a team of viticulturists created the first ever Grape Spray Guide for Texas vineyards. This publication is available online and is now established as the leading go-to resource for grape growers of all regions in Texas. The Texas Grape Spray Guide will be updated and revised annually to include new products and research based recommendations. Fritz Westover’s role in this publication was to create the format, contribute content and organize the team input.

Mengmeng Gu worked with agents and provided Earth-Kind training in 6 counties to MG’s and landscape professionals. She started a week-long Earth-Kind Landscape Short Course engaging Hort agents and faculty from 6 departments. These face-to-face presentations resulted in 1,646 contact hours to 515 clienteles.

Jayla Fry coordinates The Texas Master Gardener program; in 2011, there were 5,164 volunteers serving from 100 counties who provided 454,942 hours educational services or the equivalent of 112 people. The economic impact Master Gardeners provide the people of Texas is over 9 million dollars.

Steve George’s meetings with the Paris ISD Superintendent of Schools and other key school personnel, plus taking them on tours of an Earth-Kind display garden and an Earth-Kind Rose field trial, convinced officials to
formally adopt the Earth-Kind Environmental Landscape Management approach campus-wide at their new $50 million dollar Paris High School.

Ed Hellman was selected to present an oral paper to the Ninth International Congress of Viticultural Terroirs held in Dijon and Reims, France on 25-29 June, 2012. Hellman presented the paper “An Internet-Based GIS Application for Vineyard Site Assessment in the U.S. and Matching Grape Variety to Site” to an audience of 240 scientists from 22 countries.

Joe Masabni indicated that Extension and refereed publications were his most significant accomplishment for 2012. He submitted 12 new extension publications and one refereed journal article for publication in WeedTechnology. His Extension publications have been very popular and online downloading ranged between 69 and 732 per publication, with a total of 5,523 downloads in 2012. In addition, sales of 4 fee-based publications have generated a total of $4,640 in revenue.

Monte Nesbitt served as local coordinator for a new state-wide fruit production conference, with an attendance of 94. This fee-based program generated $7,935 in gross revenue ($1041.65 to cost recovery). Percentage gain in knowledge of participants ranged from 32% to 53% among six subject areas, with an average improvement of 41%. Based on participant’s economic rating of the program, the Texas Fruit & Nut Conference provided a collective savings of at least $28,625 dollars to 57 people.

Al Wagner tested, evaluated and provided “process authority” letters on 332 food products submitted by 81 different companies. This saved these Texas companies close to $500,000 over having to go to a company that specializes in this type of work.

In conjunction with colleagues, Jim Kamas co-authored and edited a practical Pierce's disease management guide entitled Pierce's Disease Overview & Management Guide: A Resource for Grape Growers in Texas and Other Eastern U.S. Growing Regions. This resource is the culmination of ten years of applied research and serves as a major resource in the management of this disease in grape growing regions east of the Rocky Mountains.

Larry Stein organized and coordinated the International Spinach Conference in 2012. He did this previously in 2000, 2004 and 2008. There were 75 participants from 3 countries and 10 states. This work has helped baby spinach acres in Texas increase from 0 acres in 2010, 30 acres in 2011 to over 450 acres in 2012. Price for baby spinach leaf spinach is 90 cents/lb. versus 15 cents for curly spinach.
5. FACULTY PROFILE AND SCHOLARLY PRODUCTIVITY

The Department of Horticultural Sciences faculty is organized according to the “typical landgrant” model. The faculty as a whole executes the combined teaching, research, extension/outreach missions, but individual faculty may have differing responsibilities depending on their appointment. Funding for salaries comes from Texas A&M University, Texas A&M Agrilife Research (known as the “experiment station” at many institutions), and the Texas A&M Agrilife Extension Service (known as cooperative extension at many institutions). Most on-campus faculty have joint appointments between Texas A&M University and Texas Agrilife Research, but none of the faculty at off-campus research and extension centers has a joint appointment with Texas A&M University. Joint appointments with the Texas A&M Agrilife Extension Service and TAMU or Texas A&M Agrilife Research are uncommon at present, but may be more likely in the future as per Directors Steele and Nessler.

Faculty are located geographically on-campus in College Station or at off-campus research and extension centers (Dallas, Overton, Weslaco, Uvalde, El Paso, and Lubbock; and at the Gillespie County Extension office in Fredericksburg). Location of scientists throughout the state intends to address the needs of the horticultural industry for region-appropriate research and Extension activities and to provide research support facilities for faculty, staff and students as they conduct research appropriate to the diverse cropping systems of the different horticultural regions in the state.

Because the focus of this self-study is the academic program of the Department of Horticultural Sciences, many of the metrics and much of the discussion will deal with the on-campus teaching/research faculty. These faculty have their administrative location (adloc) in Horticultural Sciences and they report their scholarly accomplishments and are evaluated annually within that unit.

Evaluation, Promotion, and Retention of Faculty
Faculty performance appraisals are conducted annually with the unit head or program leader taking the lead role. In the case of on-campus teaching and teaching/research faculty, this appraisal is done during December of every year. The faculty member submits a portfolio of documents including an up to date position description, an annual achievement report, a cumulative CV, a plan of work for the coming year, and an impact statement. About a week after these documents are submitted, the faculty member and the department head have a face-to-face meeting to discuss accomplishments for the current year and plans for the upcoming year. The department head prepares a written document outlining his evaluation, including a space for a written faculty response, and the evaluation is complete when both sign the document.

Annual evaluations of off-campus faculty appointed through Texas A&M Agrilife Research are initiated by the resident director of the Agrilife Research Center where their adloc resides. The documents prepared are very similar to those described for teaching/research faculty, but minor variations occur as deemed necessary by the resident directors. The annual face-to-face evaluation session usually involves the resident director and the department head of the disciplinary department with which the faculty member is associated.

Annual evaluations of on-campus and off-campus faculty with Extension appointments are the same within each department since the adloc of Extension specialists resides in the academic department. The process in Horticultural Sciences is led by the Program Leader & Associate Department Head for Extension. An annual
accomplishments form is completed by the faculty member, the associate head writes an evaluation response, and
a face-to-face evaluation session with the faculty member, the associate head, and the department head present is held.

*Faculty with budgeted appointments with Texas A&M University (>25% on 12 month basis, >33% on 9 month basis) are eligible for professorial rank and tenure. Faculty appointed with Texas A&M Agrilife Research and the Texas A&M Agrilife Extension Service are eligible for professorial rank, but are not on a tenure track.*

A detailed description of the departmental promotion and tenure policy accompanies this document as Appendix 5.1. The promotion and tenure policy provides a detailed explanation of eligibility for ranks and tenure, professional expectations of different ranks, expectations to be met prior to the awarding of tenure, composition of the promotion and tenure committee, and the process for post-tenure review. Non-tenured faculty on the tenure track are evaluated during their third year in a process analogous to the tenure review and are provided with extensive feedback to aid them in the process of preparing for tenure review. Junior faculty have an appointed mentoring committee to provide peer-based feedback at each stage in their professional development.

The voting members of the Horticultural Sciences faculty (all professorial titles that don’t have an adjective modifier, ex., research assistant professor) participate in and vote on all modifications of the promotion and tenure policy. The Promotion and Tenure Committee for the department includes all full professors, and the entire committee votes on recommendations for promotion. The entire committee votes on all considerations of promotion and tenure, but the votes of tenured and non-tenured members are recorded separately. According to Texas A&M University regulations, only tenure track faculty can vote on considerations of the awarding of tenure.

Table 5.1 (*next page*) lists the faculty associated with Horticultural Sciences including those faculty whose adloc is assigned to the Department (teaching, teaching/research, Extension) as well as those who are adlocated to Texas Agrilife Research centers whose professorial rank process is assigned to the Department because of their discipline. Appointments are approximate and may vary slightly from year to year depending on budgetary issues. Many of the off-campus research faculty, and some Extension specialists, are approved members of our graduate faculty and may co-advice and/or serve on graduate committees.
### Table 5.1 Faculty with teaching, research and Extension appointments in the Texas A&M Horticulture Program.

On-campus teaching FTE, 11.76; on-campus research FTE, 8.83; off-campus research FTE, 6.0; extension FTE, 11.72

<table>
<thead>
<tr>
<th>NAME</th>
<th>RANK</th>
<th>APPOINTMENT (%T/%R/%E)</th>
<th>GRAD FACULTY STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lineberger, R D</td>
<td>professor &amp; head</td>
<td>100% Admin (T / R / E, 33% each)</td>
<td>Member</td>
</tr>
<tr>
<td>Arnold, Michael A</td>
<td>professor &amp; associate head</td>
<td>50% T / 25% R / 25% Admin</td>
<td>Member</td>
</tr>
<tr>
<td>Byrne, David H</td>
<td>professor</td>
<td>50% T / 50% R</td>
<td>Member</td>
</tr>
<tr>
<td>Cisneros-Zevallos, Luis</td>
<td>associate professor</td>
<td>55% T / 45% R</td>
<td>Member</td>
</tr>
<tr>
<td>Cobb, B G</td>
<td>associate professor</td>
<td>55% T / 45% R</td>
<td>Member</td>
</tr>
<tr>
<td>Crosby, Kevin M</td>
<td>associate professor</td>
<td>80% T / 20% R</td>
<td>Member</td>
</tr>
<tr>
<td>Davies, Frederick T</td>
<td>professor</td>
<td>50% T / 50% R</td>
<td>Member</td>
</tr>
<tr>
<td>Hall, Charles R</td>
<td>professor</td>
<td>35% T / 45% R / 20% E</td>
<td>Member</td>
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<tr>
<td>Kent, Matthew W</td>
<td>assistant lecturer</td>
<td>100% Teaching</td>
<td></td>
</tr>
<tr>
<td>Klein, Patricia E</td>
<td>associate professor</td>
<td>25% T / 75% R</td>
<td>Member</td>
</tr>
<tr>
<td>Koiwa, Hisashi</td>
<td>associate professor</td>
<td>45% T / 55% R</td>
<td>Member</td>
</tr>
<tr>
<td>Lombardini, Leonardo</td>
<td>associate professor</td>
<td>60% T / 40% R</td>
<td>Member</td>
</tr>
<tr>
<td>McEachern, George R</td>
<td>professor</td>
<td>100% Teaching (retired/half time)</td>
<td>Member</td>
</tr>
<tr>
<td>McKinley, William</td>
<td>senior lecturer</td>
<td>100% Teaching</td>
<td></td>
</tr>
<tr>
<td>Miller, Julian C</td>
<td>professor</td>
<td>20% T / 80% R (retired/half time)</td>
<td>Member</td>
</tr>
<tr>
<td>Patil, Bhimanagouda S</td>
<td>professor &amp; director, VFIC</td>
<td>35% T / 65% R</td>
<td>Member</td>
</tr>
<tr>
<td>Pierson, Elizabeth A</td>
<td>associate professor</td>
<td>50% T / 50% R</td>
<td>Member</td>
</tr>
<tr>
<td>Reed, David</td>
<td>professor</td>
<td>50% Teaching/50% Admin</td>
<td>Member</td>
</tr>
<tr>
<td>Starman, Terri W</td>
<td>professor</td>
<td>60% T / 40% R</td>
<td>Member</td>
</tr>
<tr>
<td>Volder, Astrid</td>
<td>associate professor</td>
<td>45% T / 55% R</td>
<td>Member</td>
</tr>
<tr>
<td>Zajicek, Jayne M</td>
<td>professor</td>
<td>100% Teaching</td>
<td>Member</td>
</tr>
<tr>
<td>Cabrera, Raul</td>
<td>associate professor</td>
<td>100% Research</td>
<td>Member</td>
</tr>
<tr>
<td>Jifon, John</td>
<td>associate professor</td>
<td>100% Research</td>
<td>Member</td>
</tr>
<tr>
<td>Leskovar, Daniel</td>
<td>professor &amp; director, Uvalde</td>
<td>50% Research/50% Admin</td>
<td>Member</td>
</tr>
<tr>
<td>Niu, Genhua</td>
<td>associate professor</td>
<td>100% Research</td>
<td>Member</td>
</tr>
<tr>
<td>Pemberton, Brent</td>
<td>professor</td>
<td>100% Research</td>
<td>Member</td>
</tr>
<tr>
<td>Wang, Xinwang</td>
<td>assistant professor</td>
<td>100% Research</td>
<td>Member</td>
</tr>
<tr>
<td>Stein, Larry</td>
<td>professor</td>
<td>50% Extension/50% Admin</td>
<td>Member</td>
</tr>
<tr>
<td>Anciso, Juan</td>
<td>associate professor</td>
<td>100% Extension</td>
<td></td>
</tr>
<tr>
<td>Kamas, Jim</td>
<td>assistant professor</td>
<td>100% Extension</td>
<td></td>
</tr>
<tr>
<td>George, Steve</td>
<td>professor</td>
<td>100% Extension</td>
<td></td>
</tr>
<tr>
<td>Gu, Mengmeng</td>
<td>assistant professor</td>
<td>100% Extension</td>
<td>Member</td>
</tr>
<tr>
<td>Hellman, Ed</td>
<td>professor</td>
<td>75% Extension/25% TTU Research</td>
<td>Member</td>
</tr>
<tr>
<td>Masahni, Joe</td>
<td>associate professor</td>
<td>100% Extension</td>
<td>Member</td>
</tr>
<tr>
<td>Wagner, Al</td>
<td>professor</td>
<td>100% Extension (retired/half time)</td>
<td>Member</td>
</tr>
<tr>
<td>Wallace, Russell</td>
<td>associate professor</td>
<td>75% Extension/25% Research</td>
<td></td>
</tr>
<tr>
<td>Welch, Bill</td>
<td>professor</td>
<td>100% Extension (retired/half time)</td>
<td></td>
</tr>
<tr>
<td>Davis, Tim D</td>
<td>professor</td>
<td>80% Borlaug/20% Teaching</td>
<td>Member</td>
</tr>
<tr>
<td>Nessler, Craig</td>
<td>professor &amp; director, Texas Agrilife Research</td>
<td>100% Admin</td>
<td></td>
</tr>
</tbody>
</table>
Faculty Research Productivity

Departmental faculty are evaluated annually on the basis of teaching, research, and outreach productivity, both individually and as a group. Quantitative data are collected on a variety of factors believed to be indicators of productivity. These data are reviewed annually by the Deans and Directors and feedback is given to unit administrators with the goal of continuous improvement.

Horticultural Sciences faculty pursue extramural funding aggressively to drive their research and graduate programs, and to support their plant breeding and variety release efforts (Table 5.2). They and their students publish an average of almost 4 refereed publications per year in journals appropriate to their subdisciplines and research specialties and they attend national and international conferences as contributing and invited speakers to present their research to their peers. Research funding is derived from a number of federal, state, and industry sources and grants yielding indirect cost returns have increased dramatically since 2008. The Vegetable and Fruit Improvement Center had been funded for over a decade on a federal earmark, but the discontinuation of federal earmarks two years ago has raised considerable concern for the future funding of this Center. Further concern for future funding has been raised by uncertainties in the federal budget, specifically, the delay in funding for the Farm Bill since the Specialty Crops Research Initiative (SCRI) funds are bound to the Farm Bill.

<table>
<thead>
<tr>
<th>Table 5.2. Research metrics for teaching and research faculty administratively located in Horticultural Sciences by year. The reported metrics are based on 18 faculty.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td><strong>Publications</strong></td>
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<tr>
<td>Refereed Technical Articles</td>
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<tr>
<td>Books Edited</td>
</tr>
<tr>
<td>Book Chapters Authored /Co-Authored</td>
</tr>
<tr>
<td>Non-Refereed Tech Publications</td>
</tr>
<tr>
<td>Published Abstracts</td>
</tr>
<tr>
<td>Published Conf. Proc</td>
</tr>
<tr>
<td>Published Tech. Reports</td>
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<tr>
<td>Grants or Contract Reports</td>
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<tr>
<td>Other (please list)</td>
</tr>
<tr>
<td>Variety Release Pub</td>
</tr>
<tr>
<td>Trade Journal</td>
</tr>
<tr>
<td>Newsletter</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Grants and Contracts</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Grant Proposals Submitted</td>
</tr>
<tr>
<td>Federal Competitive Funding Received</td>
</tr>
<tr>
<td>Commodity or Industry Funding Rec.</td>
</tr>
<tr>
<td>Other External Funding Received</td>
</tr>
<tr>
<td>State/Federal Initiative Funding Rec.</td>
</tr>
<tr>
<td>Indirect Cost Returned to Unit</td>
</tr>
<tr>
<td>Other (please list)</td>
</tr>
<tr>
<td>TOP - TAMU</td>
</tr>
<tr>
<td>State Competitive</td>
</tr>
<tr>
<td>Royalties</td>
</tr>
<tr>
<td>Foundation Transfers</td>
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</tbody>
</table>
Use of Academic Analytics to Document Scholarly Productivity

We are challenged by College and University administration to document our scholarly productivity in comparison with our peers at other institutions. One tool to obtain comparative documentation is the Academic Analytics® database, a metadata warehouse that collects information about the publications, citations, grants, professional awards, and other indicators of faculty research productivity (http://academicanalytics.com).

The Texas A&M Department of Horticultural Sciences was ranked 5th in overall faculty scholarly productivity according in the 2009 Academic Analytics® data, 3rd in the 2010 database, and 5th in the recently released 2011 data when compared to the landgrant horticultural programs nationally (Table 5.3). However, since the 2011 dataset incorrectly lists our senior lecturer, we will have to re-run the data once that correction is made. It is our understanding that the dataset is to be restricted to tenure-track faculty.

Table 5.3. Ranking of landgrant horticulture programs in the 23 peer institutions in the Academic Analytics database (2009, 2010, and 2011 data).

<table>
<thead>
<tr>
<th>DATABASE YEAR</th>
<th>RANK</th>
<th>HORTICULTURE PROGRAM</th>
<th># FACULTY</th>
<th>FSPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>5</td>
<td>Texas A&amp;M University</td>
<td>15</td>
<td>0.9</td>
</tr>
<tr>
<td>2010</td>
<td>3</td>
<td>Texas A&amp;M University</td>
<td>18</td>
<td>1.3</td>
</tr>
<tr>
<td>2011</td>
<td>5</td>
<td>Texas A&amp;M University</td>
<td>19</td>
<td>0.9</td>
</tr>
</tbody>
</table>

The faculty scholarly productivity index (FSPI) is a weighted algorithm calculated from the following parameters:

1. Books variables; (percentage of faculty who have authored a book, books published per faculty member)
2. Journal publication variables; (percentage of faculty who have authored a journal article, journal articles published per faculty member)
3. Conference proceedings variables; (percentage of faculty who have authored a conference proceeding, conference proceedings published per faculty member)
4. Citations variables; (percentage of faculty for whom at least one published journal article has been cited at least once, citations per faculty member, citations per journal article)
5. Federal funding variables; (percentage of faculty who have won new and competitive federal research funding, grants per faculty member, grant dollars won per faculty member, dollars per grant)
6. Honorific awards variables; (percentage of faculty who have won an honorific award, honorific awards per faculty member)


Academic Analytics® graphically presents the data categories that are included in the FSPI as a “flower diagram” in which the radius of the “petals” indicate the group’s performance relative to the national mean. In 2009, our faculty scored lower than the national mean on parameters related federal grant funding, but above the mean in other areas of productivity including publications, citations and awards (Fig. 5.2).
Figures 5.2. Performance of TAMU Horticultural Sciences faculty (radii) compared to the national mean (inner filled circle) on 22 indicators of scholarly productivity in the 2009 Academic Analytics® database.

More recently, our faculty performed substantially above the national mean on all but one indicator of productivity (number of faculty with an article in the 2010 data (Fig. 5.3), and total number of grants in the 2011 data (Fig. 5.4).
Figures 5.3, 5.4. Performance of TAMU Horticultural Sciences faculty (radii) compared to the national mean (inner filled circle) on 22 indicators of scholarly productivity in the 2010 and 2011 Academic Analytics® databases.
We recognize that the Academic Analytics® data do not evaluate the entire breadth of the duties our faculty perform, nor do they even address many of the research metrics we report to our administration (industry or commodity funding, for example; teaching related activities). However, use of Academic Analytics® is valuable as one measure, because it allows comparing ourselves to our peers according to a common yardstick using data accumulated by a nonbiased source.

**Faculty Teaching Workload**

Faculty workloads are reported annually by the Office of Data and Research Services (DARS). Workload is reported as SCH (student credit hours) and WSCH (weighted student credit hours; a number that accounts for the level of the course, the CIP code of the course, and the level of the students taking the course; a Ph.D. student taking a 6xx level course has a much higher weighting that a freshman taking a 1xx course, for example). Reports are available that compute these data in such fine detail that one can determine the dollars generated per FTE per semester, but that level of cost accounting is beyond the scope and purpose of the self-study.

Faculty workloads over time, and compared to other departments, provides useful information for examining general enrollment trends, and general trends in faculty workloads.

During the period of FY2009 – 2012, SCH per FTE increased in undergraduate courses and Masters level instruction, but remained very steady (and comparatively low) in courses at the Ph.D. level (Table 5.4).

Maintaining SCH during a period in which the teaching budget was reduced by over 15% took the cooperation of many faculty in the department who were willing to assume an additional teaching load. In 2012, Dr. Joe Novak’s position was lost due to the severe budget cut. During the preceding year (FY2011), he had a heavy teaching load at the 300 level and in fact, his teaching load alone accounted for over 20% of the departmental SCH. His courses were assigned to other faculty.

Additionally, Casey Krueger’s position was lost in FY2012 and he also taught several 3xx and 4xx courses, albeit their enrollment was a fraction of those taught by Dr. Novak. Only one of Mr. Krueger’s courses has been transferred to another faculty member. These observations explain the increase in SCH per FTE at the undergraduate level.

<table>
<thead>
<tr>
<th>Table 5.4 Student Credit Hours (SCH) per faculty FTE by fiscal year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2009</td>
</tr>
<tr>
<td>FY 2010</td>
</tr>
<tr>
<td>FY 2011</td>
</tr>
<tr>
<td>FY 2012</td>
</tr>
</tbody>
</table>

*SCH per faculty FTE is computed by dividing the SCH generated at a certain level by the faculty FTE at the same level. The FTE of faculty and GATs who are not teaching are excluded in the calculation by level but are included in the Total column.

STAR reports at: [http://dars.tamu.edu/Data-and-Reports/Faculty#workload](http://dars.tamu.edu/Data-and-Reports/Faculty#workload)

The Horticultural Sciences faculty rank at about the midpoint in the College of Agriculture and Life Sciences in terms of SCH per FTE according to College data (Fig. 5.5). Seven departments teach more SCH/FTE and six teach less.
Weighted student credit hours data (WSCH) takes into account the level of the course as well as the level of the students taking the courses. WSCH were lower in 2012 than they were in 2008 in all categories except hours at the Masters level (Table 5.5). We have noticed decreased enrollments in several of our larger undergraduate courses, and much of the difference may be accounted for the drop in WSCH at the PhD level since that number depends so heavily on course enrollment of doctoral students. Since the number of doctoral students in the department is the same in 2012 as it was in 2008 (Table 3.3), these students may be taking fewer courses in the department (or fewer graduate students in other departments are taking our upper level courses), either of which could account for the lower WSCH.
### Table 5.5. Horticultural Sciences Weighted Student Credit Hours Taught by Year

<table>
<thead>
<tr>
<th></th>
<th>Lower Div</th>
<th>Upper Div</th>
<th>MS</th>
<th>PhD</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2008</td>
<td>7656</td>
<td>10405</td>
<td>2117</td>
<td>4848</td>
<td>25028</td>
</tr>
<tr>
<td>FY 2009</td>
<td>6222</td>
<td>8555</td>
<td>2239</td>
<td>4478</td>
<td>21493</td>
</tr>
<tr>
<td>FY 2010</td>
<td>6041</td>
<td>8817</td>
<td>2123</td>
<td>2926</td>
<td>19908</td>
</tr>
<tr>
<td>FY 2011</td>
<td>6069</td>
<td>8133</td>
<td>3132</td>
<td>3011</td>
<td>20346</td>
</tr>
<tr>
<td>FY 2012</td>
<td>6328</td>
<td>9069</td>
<td>2522</td>
<td>3503</td>
<td>21605</td>
</tr>
</tbody>
</table>

### Faculty Collaborations

#### Vegetable and Fruit Improvement Center

The Vegetable and Fruit Improvement Center (VFIC) conducts research to improve human health and reduce risk from chronic diseases such as cancer and cardiovascular diseases. The interdisciplinary center works in partnership with producers, processors, grocery chains, and seed companies to promote increased consumption of fruits and vegetables, and to develop quality fruit, vegetable, and nut varieties with enhanced health and nutritional benefits in an efficient, economical and environmentally sound system. The goal of the VFIC is to provide solutions, through the development of new technologies and plant varieties, for producing quality vegetable and fruit products. VFIC scientists have contributed to the Texas economy in multiple ways, including releasing new varieties of pepper, melon, onion, carrot, tomato, peach and plum. In addition, VFIC research on the health benefits of juice consumption has helped increase Texas citrus juice sales to Japan. In 2004, there was only one buyer from Japan but now there are seven buyers with approximately $6.5 million in sales of juice from Texas to Japan. VFIC scientists isolated 56 novel bioactive compounds from fruits and vegetables; these compounds have potential research value to several researchers across the state and nation.

Under the leadership of Dr. Bhimu Patil, VFIC scientists have secured approximately $14.9 million in grants including NIH, NSF, TDA-TIE, USDA-Challenge grants, DOE and USDA-Special grants. The interdisciplinary center has 21 scientists with diverse research expertise ranging from plant breeding, natural product chemistry, biochemistry, education, economics, postharvest physiology, physiological genetics, plant secondary metabolites, nutrition, medical science, and cropping systems. VFIC scientists have contributed a wealth of information to the scientific literature, including 255 peer-reviewed publications, 5 books, 28 editor reviewed publications and 349 invited presentations. The VFIC also hosted one national conference and two international symposia in College Station, Houston and South Padre Island. Always a priority for VFIC scientists, teaching and graduate advising has resulted in 42 graduate students (28 PhD and 14 MS) completing their degrees and 121 undergraduate students receiving hands-on training in lab techniques. Following completion of their degrees, 98% of graduate students are employed.

#### Benz Endowed Floral Design Program

Established at the bequest of floral design innovator M. “Buddy” Benz, the Benz Endowed Chair and School of Floral Design is a multifaceted program which includes the academic Bachelor of Arts program in floral design/event planning, the Benz Gallery of Floral Art and the Benz School of Floral Design, which offers a variety of basic and advanced courses for floral designers. The Chair holder is Mr. Bill McKinley, world-renowned designer and floral educator. The Benz Program has an international impact, collaborating with designers in Europe, Australia, Canada and Mexico and established a branch program in South Korea in 2007, The Benz School-Korea. The Benz School-Korea program has grown significantly and will begin its third sequence of teacher training in August 2013. Mr. McKinley’s collaborations with industry organizations spans many years and includes multi-phased online educational programs as well as state and national certification programs.
Ellison International Chair in Floriculture
The mission of the Ellison Chair in International Floriculture is to advance the health and vitality of the floriculture industry on a national and international scope through exemplary academic leadership, cutting edge applied research, innovative extension outreach programs, and by mentoring well-educated, impassioned leaders to support the future of floriculture. During the past 5 years, Chairholder Dr. Charles Hall obtained $1.1 million in grant funds, including collaborations with 48 scientists on 19 funded grant projects and authored or co-authored 31 refereed journal articles, 42 industry trade publications, 8 refereed proceedings, 9 professional paper presentations, and 140 national and international invited presentations at industry-related venues. In addition to teaching undergraduate courses, the Chair has supervised 6 Master’s and 4 PhD students, and teaches a course annually in the joint TAMU-UVG Master’s program in Guatemala. The Ellison Chair has high visibility on the national scene, serving on 12 industry boards. Since 2007 the Chair has been conferred with 5 national awards in recognition of outstanding service to the green industry.

Basye Endowed Chair in Rose Breeding
Established through the generosity of Dr. Robert Basye to further his passion to develop roses resistant to the blackspot disease, the mission of the Basye Chair in Rose Breeding has expanded to include the evaluation and release of the Moore Roses, a collection of patented varieties and over 350 unreleased selections donated by Ralph Moore in 2008. Under the leadership of Basye Chair Dr. David Byrne, this program has obtained nearly $400,000 in external funding in the last five years, contributed to the scientific literature in rose and peach genetics, and mentored graduate students. The impact and scope of the program will increase as the funding generated by the revenues from variety releases begins to be realized.

Junior Master Gardener® (JMG) Program – Created, trademarked, and administered within the Department, this international youth gardening 4-H program enrolls more than 200,000 Texas children annually (representing 1/5 of Texas 4-H annual enrollment) through over 300 registered groups. The program continues to expand with JMG groups in all 50 states; 36 land-grant universities are registered/licensed JMG program partners; and 10 foreign countries, from Guatemala, Honduras, to South Korea, have JMG programs. In 2009, through a partnership with Texas A&M Texas AgriLife Extension horticulture staff with the Junior Master Gardener (JMG) program, Dr. Lombardini (HORT) and Dr. Wingebach (ALEC) received federal funding (Higher Education Challenge Grant) for $147,000 to train TAMU undergraduate and graduate students to conduct experiential learning activities by using the JMG curricula to teach children in Latin American countries. The current focus of JMG is toward activities associated with the $5 million USDA-AFRI grant secured by an interdisciplinary team led by Judy Warren and Lisa Whittlesey titled "Using Family Focused Garden, Nutrition and Physical Activity Programs to Reduce Childhood Obesity."

Potato Breeding and Variety Development Program
Fourteen improved varieties have been developed/co-developed and/or released from the Texas Potato Breeding and Variety Development Program. Virtually all of the russet potatoes grown in Texas in 2012 were the improved Texas Russet Norkotah strains. When this program was initiated in 1973, the average yield of the summer crop in Texas was about 200 Cwt/A. In 2009 the average yield in Texas was reported to be 460 Cwt/A, the highest in the nation among 11 states with summer crop production. In addition, the farm gate value of the crop has grown from less than $20 million to about $100 million with an annual economic impact to the state estimated to exceed $300 million. Of all varieties released over the past 15 years by the 12 potato breeding programs in the U.S., those developed by the Southwest Project, which includes the Texas and Colorado breeding programs, rank second nationally in total acreage approved for seed certification in 2010. In 2010, the three Texas Russet Norkotah selections (TXNS112, TXNS278, and TXNS296) collectively ranked fourth among the top 50 US varieties in acres accepted for seed certification, behind only Russet Burbank, Frito Lay varieties, and Ranger Russet. Varieties from the program have brought in some $3 million in royalties to the Texas A&M University System.

The Texas Superstars® Program
The Texas Superstars® Program is a joint effort among Texas A&M AgriLife Research, Texas A&M AgriLife Extension, Texas Department of Agriculture and the Texas green industry to promote the use of better regionally-
adapted plants to minimize the resources required to produce, establish plants in regional landscapes, and to maintain plants as valuable components of aesthetically pleasing and environmentally sustainable landscapes. A concomitant effort of this group is to assist the green industry in developing new plant products to provide consumers sustainable choices for Texas’ regional landscapes. This goal is in part met by promoting in a coordinated fashion plants proven in research trials to provide excellent aesthetic effects with minimal inputs as Texas Superstar® plants. These new or underutilized plants may originate from sources outside the Texas A&M AgriLife system or may be plants selected or bred by programs within the Texas A&M AgriLife system. These trials are often conducted with involvement from undergraduate and graduate students, Master Gardeners, or other volunteer groups as well as faculty and staff in the Texas A&M AgriLife system. Promotional efforts are done in collaboration with the Texas Department of Agriculture and involve numerous media and the statewide horticulture agent group as well as our industry partners. Funding is primarily through the use of tag revenues, licensing and grants.

**Pecan Physiology and USDA Pecan Breeding Cooperation**

Under the leadership of Dr. Lombardini, the pecan research program involves collaborations with USDA-ARS as well as New Mexico State University and UC Davis. In 2009, this program received SCRI (Co-PI’s: Drs. Lombardini and Volder) funding to study the effects of nitrogen application rates on above- and belowground production of pecan seedlings. This research will shed light on various aspects of pecan root development as well as will likely lead to revised nitrogen application recommendations that can save significant amounts of money as well as reduce environmental impacts. The scientists at the USDA-ARS are excellent cooperators and their facilities are a tremendous resource for graduate students’ research and are frequent destination for field trips for undergraduate courses. Dr. Grauke, Research Horticultrist & Curator of the USDA-ARS Pecan Breeding, has served on one Ph.D. student’s committee, chaired by Dr. Lombardini, and the collaboration has generated three refereed publications and five presentations at professional meetings. The collaboration between Dr. Lombardini and Dr. Grauke is ongoing and the two are currently Co-conveners of the 1st International Symposium on Pecans and Other Carya in Indigenous and Managed Systems, which is scheduled for summer 2013.

**Pecan Physiology and AgriLife Extension**

The pecan research program benefits from its strong partnership with Mr. Monte Nesbitt (AgriLife Extension). Lombardini and Nesbit have joint research projects and frequently advise students and growers on pecan cultivation and other issues. In 2011, their collaboration with Dr. Pegg at the University of Georgia and Dr. Cisneros-Zevallos (Texas A&M Horticultural Sciences), developed into a funded SCRI grant which will provide funding for five years “to increase the long-term competitiveness of U.S. pecans based on their nutritional and health promoting components.”

**Horticultural Biotechnology – Biofuels**

The focus of the multi-disciplinary biofuels research team is to develop new sources of biofuel feedstocks for the emerging bioenergy market. This group has been developing sweet sorghum and high biomass cellulosic energy sorghum as dedicated bioenergy crops for the past 5 years. More recently the group is exploring intergeneric hybridization between sorghum and sugarcane that would allow for rapid and efficient introgression of traits from both sorghum and sugarcane into a new hybrid crop for ethanol production. The sorghum breeding and genomics team members from Horticulture, Soil and Crop Sciences and Biochemistry have developed first generation sweet sorghum hybrids that are now being grown in Brazil to extend the sugarcane milling season. Additionally the first cellulosic energy sorghum hybrids developed by the group are being sold under the Blade® Energy Crops brand by Ceres, Inc. This research team has secured more than $23.6M in external grants from NSF, USDA, DOE and industry sources since 2000. The Sorghum Bioenergy Breeding and Genomics Team received the inaugural 2012 College of Agriculture and Life Sciences Dean’s Outstanding Achievement Award for Interdisciplinary Research.

**Horticultural Biotechnology – Stress Physiology**

The abiotic stress physiology (Dr. Koiwa) focuses on understanding plant responses to various osmotic stresses, such as cold, drought, heat, and salinity, as well as responses to nutrition deficiency. The gene expression sub-discipline established collaboration with Dr. Fukuhara's group in Japan, and Dr. Zhu's lab at the University of Maryland. Protein modification sub-discipline established collaboration with Dr. Fujiyama in Japan and Dr. von Schaewen in Germany. In the last five years,
Dr. Koiwa's group obtained nearly $1 million for federal research grants as PI (about $600,000 were allocated to TAMU), and authored and co-authored 20 refereed articles.

**Environmental Physiology**

In collaboration with the departments of Soil and Crop Sciences, Landscape Architecture and Atmospheric Sciences as well as the Houston Texas A&M AgriLife Horticultural Extension service a thriving green roof research program has been developed that combines aspects of controlled green roof research (individual test plots on Langford building, funded by a $10,000 grant from the College of Architecture), *in situ* green roof research (Houston, in-kind industry funding) and experiential learning for undergraduate students (new green roof and wall built on Langford building, funded by a $300,000 grant from TAMU Dean of Faculties). The experiential learning project started in summer 2012 and has trained 35 undergraduate research students, attracted 150 undergraduate visitors, and generated two popular press articles, two student research presentations and a well visited student blog so far. All these research sites are fully instrumented to test for impacts of green roofs on the microclimate as well as effects of green roofs on runoff quantity and quality. Additional urban environmental collaborations include testing the effect of pavement on urban tree physiology (in conjunction with the department of Ecosystem Science and Management, supported by funding from the Texas A&M Forest service), as well as selecting drought tolerant genotypes of live oak and other urban trees for breeding purposes (collaboration with ESSM and the Texas A&M Forest Service). The environmental physiology program run by Dr. Volder also collaborates with a local grower (Millican Farms) to test the potential use of halophytes to alleviate salt stress on watermelons grown on small acreage farms. This project is funded by a $73,000 specialty crop block grant through the Texas Department of Agriculture.

**Earth-Kind® Landscaping Program**

The Earth-Kind® landscaping program is a collaboration effort between Extension specialists and county agents, which focuses on education for landscape water conservation, reduction of fertilizer and pesticide use, landscaping for energy conservation, and reduction of landscape wastes entering landfills. The program promotes the use of native and adapted plant species to provide habitat and reduce water requirements, and minimizing the use of potentially harmful chemical fertilizers and pesticides. Fifty-six percent of evaluation respondents indicate they will adopt one or more water-conservation practices, reducing their annual landscape water use by 31 percent. This reduction in landscape water could result in an annual savings of approximately 6,800 gallons per household, and 27.7 million gallons for all participant respondents. The potential water cost savings to these users is approximately $117,000 per year based on average municipal water rates. More than 5,000 participants indicate they anticipate a cost savings of $217 per year, or $1 million in total, associated with reducing their use of pesticides and fertilizer. In addition to these water-costs savings, the ultimate societal benefit to Texas is a more efficient use of scarce water resources.

**Borlaug Institute for International Agriculture Programs**

As regional director of the Borlaug Institute programs for Asia, Tim Davis has collaborated with Horticultural Sciences faculty including Drs. Cisneros, Davies, Patil, Masabni, and Lombardini to support horticultural development programs at 3 Indonesian universities (Bogor Agricultural University, Udayana University and Sam Ratulangi University). He is also cooperating with Mengmeng Gu in her developing study abroad program in China and is currently developing a plan for increasing the emphasis on scholarly activities involving Texas A&M Horticultural Sciences faculty and their peers in China.

**Plant Bioactives & Bioprocessing Research Program**

The vision of the Plant Bioactives & Bioprocessing Research Program is to generate scientific information of drug discovery associated with the prevention and the progression of chronic diseases using US commercial crops and native crops from centers of biodiversity. This vision is complemented by understanding how health-promoting secondary metabolites are synthesized in plants using stresses as well as understanding how microbes and plant surfaces interact to design ways of delivering safe fresh produce.

We aim to have Texas A&M and our collaborators bridge between the US health market (e.g., functional foods, dietary supplements, cosmetics and pharmaceutical) and growers and processors in the US as well as in Latin America in a win-win relationship while using these centers of biodiversity in a sustainable way.
For the past 5 years under the leadership of Luis Cisneros-Zevallos, the program has obtained nearly $1.35 million in grants and contracts from TDA, USDA and industry to conduct research in cancer and the metabolic syndrome (obesity, chronic inflammation, cardiovascular and diabetes), post-harvest biosynthesis of secondary metabolites and microbe-plant surface interactions. A total of 10 graduate students have been involved (6 PhD and 4 MS) from the areas of Food Science, Horticulture, MEPS and Chemical Engineering, 3 post-docs, 7 research assistants and 31 visiting scientists. The program has contributed 30 peer-reviewed publications, 3 book chapters, 4 editor reviewed publications, 6 press releases and more than 45 invited presentations in the US and internationally.

The program has strong collaboration activities with research institutions in the 3 largest centers of biodiversity in Latin America (Andean region of Peru, Mexico and the Brazilian Amazon), Europe and Asia. We have been active in disseminating through short courses, presentations and student exchange activities using different tools including the FIPSE program, which is a collaborative effort with UC-Davis, U Florida and partner institutions in Spain, Italy and Greece. More recently, we initiated an agreement with EMBRAPA, Brazil (sponsored by USDA), through Ricardo Elesbao Alves to conduct research and recruit visiting scientists and new incoming graduate students sponsored by the Brazilian government.

Our program has strong collaborations with other faculty on campus (A. Castillo, M. Akbulut, C. Wu, M. Taylor) as well as other groups in our Department including the VFIC (B. Patil), the Pecan Physiology Program (L. Lombardini), Horticultural Biotechnology Program (H. Koiwa) and the Borlaug Institute (T. Davis) among others.
6. FISCAL RESOURCES OF THE HORTICULTURAL SCIENCES DEPARTMENT

Changes in Appropriated Funds over Time
Consistent with the national trend in state and federal appropriations to higher education, the Department of Horticultural Sciences “hard money” budget has decreased markedly since 2010. The departmental budget from all appropriated sources is 18% less that was in 2010, much of that decrease occurring during the current biennium. Because of a reduction in state funds allocated to Texas A&M University, Texas A&M Agrilife Research, and the Texas A&M Agrilife Extension Service, and with an added reduction due to an internal reallocation program at the University level, the budget for the current biennium decreased nearly 15%. Concurrently on the federal side, the USDA special grant for the Foods for Health program was lost, resulting in the loss of over $1.2 million that funded several research programs in the department.

<table>
<thead>
<tr>
<th>Table 6.1. Changes in the Horticultural Sciences budget from all appropriated sources over the period FY 2007 – 2013.</th>
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</thead>
<tbody>
<tr>
<td>FY 2007</td>
</tr>
<tr>
<td>FY 2008</td>
</tr>
<tr>
<td>Merit, enrollment growth, mandates, equity</td>
</tr>
<tr>
<td>Reduction</td>
</tr>
<tr>
<td>FY 2009</td>
</tr>
<tr>
<td>Mandate, promotion</td>
</tr>
<tr>
<td>FY 2010</td>
</tr>
<tr>
<td>Mandates, Merit</td>
</tr>
<tr>
<td>Reduction</td>
</tr>
<tr>
<td>Mid-Year Cut</td>
</tr>
<tr>
<td>FY 2011</td>
</tr>
<tr>
<td>Reduction</td>
</tr>
<tr>
<td>FY 2012</td>
</tr>
<tr>
<td>Reduction</td>
</tr>
<tr>
<td>FY 2013</td>
</tr>
<tr>
<td>Merit 3.0% (1.5% add to base and 1.5% one time)</td>
</tr>
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</tr>
</tbody>
</table>

Total loss in departmental funding from all sources since 2010 = $823,558 (18% decrease)

The state budget reduction for the 2012-13 biennium had severe repercussions on our department. On the teaching side, two non-tenure track positions were lost. Another was lost due to not being able to fill a position.
that became vacant because of a tenure denial. One of these faculty members (Dr. Joe Novak) taught 22% of our SCH for spring 2011. Another (Casey Krueger) taught our landscape graphics, design, and maintenance/construction courses, expertise that was unique within our department. A third faculty member (Dr. Steve King) taught vegetable production and served as the advisor/coordinator for the Howdy! Farm student sustainable farming operation.

Implications for teaching and research program support were also quite negative. All technical support positions were transferred to “soft money” support, and those faculty who did not have grants or other sources of funding for their personnel were forced to terminate them. At present, the department maintains its horticulture farm with one farm manager and student or part time workers, and its two greenhouse complexes with student workers who are supervised by a faculty member.

On a positive note, the department did receive supplemental funding to support its high impact/experiential learning initiative ($53,000 for academic year 2012, and $57,250 for 2013) and continues to receive Instructional Equipment Enhancement Fees and Computer Access fees to support undergraduate instruction. IEEF fees are charged at the time of registration and they vary between $10 and $175 per course (Table 6.2). The amount is determined by the course instructor (with the approval of the department head and dean of the College) and they represent unique expenses associated with the course/lab (cost of flowers for floral design, media and supplies for plant propagation, etc.). IEEF fees are tracked so that they must be spent on the course that generates them, except for a small pool that may be held at the departmental level for large, multi-course enhancement expenses.

<table>
<thead>
<tr>
<th>Table 6.2. Instructional Equipment Enhancement Fees (IEEF) collected for horticulture courses by academic year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
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<td>2008</td>
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<td>2009</td>
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<td>2010</td>
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<td>2011</td>
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<tr>
<td>2012</td>
</tr>
<tr>
<td>2013</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 6.3. Computer access funds and faculty workstation program funds allocated to Horticultural Sciences by year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Access</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>2008</td>
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<tr>
<td>2009</td>
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<td>2010</td>
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<tr>
<td>2011</td>
</tr>
<tr>
<td>2012</td>
</tr>
<tr>
<td>2013</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Computer access fees are collected to support instructional computing equipment and software that is available for use only by the students (computer labs, special printers, scanners, etc.). Our department has maintained a computer lab for our undergraduate students since 1990, and in addition, an open access computer lab maintained by Texas A&M University Computing and Information Services is located on the ground floor of our building. The Faculty Workstation Program was established to insure that teaching faculty have access to adequate personal computing equipment. Faculty members may qualify for matching funds to purchase new desktop computers or laptops for use to support teaching, with the University providing a 3:1 match up to $1500. Generally a faculty member may qualify for the program every 3 or 4 years.
Endowed Chairs, Programs and Scholarships

Endowed Chairs

Basye Chair in Rose Breeding and Genetics
Robert Basye was a mathematics professor by vocation, but a world-class rose breeder by avocation. Breeding roses to increase resistance to diseases was his passion and conquering the blackspot disease of roses was his lifetime goal. His generous donation established an endowed professorship to support rose breeding and genetics. The current holder of that distinguished professorship is Dr. David Byrne.

Ellison Chair in International Floriculture
The Ellison Chair in International Floriculture is named after Jim and Ellen Ellison, who spearheaded the campaign to generate industry funding for the Chair. The mission of this Chair is to advance the health and vitality of the floriculture industry on a national and international scope through exemplary academic leadership, cutting edge applied research, innovative extension outreach programs, and by mentoring well-educated, impassioned leaders to support the future of floriculture. The current holder of the Ellison Chair is Dr. Charlie Hall.

Benz Chair in Floral Design
The only floral design endowed chair in the world, the Benz Chair was established at the bequest of floral design innovator M. “Buddy” Benz. The Benz Endowed Chair and School of Floral Design is a multi-faceted program which includes the Benz Gallery of Floral Art, located in the expansive atrium of the Horticulture/Forest Sciences Building, and the Benz School of Floral Design, which offers a variety of basic and advanced training courses for floral designers annually. The bequest also supports the teaching activities of the Chair holder, Mr. Bill McKinley, world-renowned designer and floral educator.

Endowed Programs

Vegetable and Fruit Improvement Center
The Vegetable and Fruit Improvement Center (VFIC) was established in 1992 under the direction of Dr. Leonard M. Pike, to support and strengthen the total vegetable industry through research. Its goal is to develop new technologies for producing quality vegetable products in an efficient, economic and environmentally sound system, with a focus on achieving health and nutrition benefits. In March 1999, fruit was officially added to the name and research scope of the Center. The Center is directed by Dr. Bhimu Patil. The Vegetable Improvement Center Endowment was established to strengthen the Texas vegetable industry by attracting and maintaining the highest quality scientists, attracting and training the highest quality students, improving innovative research and extension programs, developing new and advanced research technologies to improve economic productivity, and protecting and improving the environment while sustaining vegetable production.

Texas Pecan Endowment
The Texas Pecan Endowment supports research, education and extension activities that benefit the pecan industry and supports ongoing development activities for the benefit of the fund.

Texas Ornamentals Program Enhancement Endowment
This endowment was established to strengthen the Texas ornamental horticulture industry by attracting and maintaining the highest quality scientists, attracting and training the highest quality students, improving innovative research and extension programs, developing new and advanced research technologies to improve economic productivity, and protecting and improving the environment while sustaining ornamental horticulture.

Henry and Mary Nemcik Endowed Garden Fund
This endowment was established to provide support for the Horticultural Gardens near Hensel Park.
**Lou Cashion Memorial Garden Fund**
This fund supports all activities and needs at the TAMU Horticultural Gardens and Field Laboratory, with a focus on maintaining the area identified as the Lou Cashion Memorial Garden.

**Ralph S. Moore Miniature Rose Excellence Fund**
The Moore Rose Excellence Fund are used for activities that preserve the legacy of Mr. Ralph S. Moore’s research in miniature roses and woody ornamentals and enhance the teaching, research and extension mission of the department.

**Horticulture Teaching Technology Endowment**
The Teaching Technology Endowment intends to insure that horticulture students receive instruction in the use of state of the art equipment, software and educational tools that pertain to the art and science of horticulture. The goal is that Texas A&M horticulture graduates will be recognized nationally as having received the most advanced instruction in the application of advanced technology to horticultural problems.

**Horticulture Scholarship Endowments**
A growing list of endowed scholarships provide awards to outstanding students annually in amounts ranging from $1,000 to $2,000 (Table 6.4). In addition to the endowed scholarships, other benefactors including commodity groups, garden clubs, and individuals provide funding and our department generally awards in excess of $50,000 to students at our annual awards banquet held on Parent’s Weekend every year.

<table>
<thead>
<tr>
<th><strong>Floriculture/Greenhouse</strong></th>
<th><strong>Initial Endowment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Nightingale Memorial Endowed Scholarship</td>
<td>$10,000</td>
</tr>
<tr>
<td>Jim Ellison Endowed Scholarship</td>
<td>$25,000</td>
</tr>
<tr>
<td>Ellen Ellison Scholarship</td>
<td>$25,000</td>
</tr>
<tr>
<td>Robert Rucker Floriculture Scholarship</td>
<td>$15,000</td>
</tr>
<tr>
<td>Bill Walker Memorial Scholarship</td>
<td>$2,050</td>
</tr>
<tr>
<td>Margaret Plum Floriculture Scholarship</td>
<td>$10,000</td>
</tr>
<tr>
<td>Robbie Jane Paup</td>
<td>$100,000</td>
</tr>
<tr>
<td>Jim Johnson Scholarship in Horticulture</td>
<td></td>
</tr>
</tbody>
</table>

**Urban/Landscape Horticulture**

| Don Wilkerson & Sharon Duray Sch.                   | $25,000               |

**Pomology - Fruit and Nut Production**

| Fred Brison Scholarship (Texas Pecan Growers)       |                       |

**General**

| Joel Ray Reese ’50 Sch Hort Sci                    | $25,000               |
| C.O. Smith, Class ’50 (Bethancourt)                | $25,000               |
| Jayson Guy Harris Scholarship                      | $5,000                |
| Leon Miller Opportunity Award Scholarship          | $5,000                |
| Everett R Emino Endowment Fund Scholarship         | $1,000                |
| Joe Novak (Warren Barham) Scholarship              |                       |
| Dan Hannah Memorial Scholarship in Hort. Sciences  | $25,000               |
| COADC Sam Cotner Scholarship                       | $25,000               |
| Texas Food Processors Scholarship                  | $1,000                |
| Leon C. Osborn Memorial Scholarship               | $1,000                |
| Leonard M. Pike Endowed Scholarship                |                       |
Juan Reymundo Anciso
Associate Professor and Extension Specialist
j-anciso@tamu.edu

Program Summary
Dr. Anciso is the Extension Specialist for vegetables and citrus for the 21 county area of Texas A&M AgriLife Extension’s District 12 which stretches from Brownsville to Eagle Pass. Since joining the Department of Horticultural Sciences in November 2002, he had coordinated the IPM program for citrus and vegetable pest management as the Extension IPM Agent for Hidalgo and Cameron counties from 1989 thru 2002 in the Department of Entomology.

Dr. Anciso’s area of research is vegetable pest management, vegetable production and food safety on the farm known as Good Agricultural Practices (GAPs). He has written several scientific and popular articles on vegetable pest management and food safety on the farm. He attends the annual USDA IR-4 Food Use Workshop as the plant pathology representative for Texas. He also represents Texas on the National Good Agricultural Practices committee, Produce Safety Alliance and United Fresh’s GAPs Harmonization effort that addresses GAPs food safety in produce.

Academic Background
Degree Year Institution Major
Ph.D. 1989 Texas A&M University Plant Pathology
M.Agr. 1984 Texas A&M University Plant Protection
B.S. 1983 Texas A&M University Biology

Professional Experience
2008-Present. Associate Professor and Extension Specialist. Texas A&M AgriLife Extension. (100% Extension)

2002-2008. Assistant Professor and Extension Specialist. Texas Cooperative Extension. (100% Extension appointment in Department of Horticultural Sciences). Assignment is to provide effective planning, development and implementation of educational programs needed to meet the informational expectations of the clientele and extension agents. These educational programs have focused on vegetable production including pest management control strategies as well as food safety for vegetables from the field to the packing shed. Responsibilities include educational outreach on commercial vegetable production in District 12 for producers, support people and extension agents. Areas of applied research include food safety, pest management strategies in vegetables, and coordination of the state-wide watermelon variety trials.

1989-2002. Extension Agent-Integrated Pest Management Level III Agent. Texas Agricultural Extension Service. (100% Extension appointment in Department of Entomology). Responsibility included supervision of the Citrus IPM and Vegetable IPM programs. Development of IPM programs in citrus and vegetables both in disease and insect pest management in Hidalgo and Cameron counties. Hosted numerous international scientists, (Canada, China, Eritrea, and India), on various projects. Other projects as a co-investigator include Florida red scale project, bio-intensive whitefly management, citrus producers manual, diamondback moth management, and electronic delivery of pest information. International travel to Honduras and Nicaragua to present vegetable pest management training under the USDA Hurricane Mitch project.

Refereed Publications 2007-2012


**Editor reviewed publications, abstracts or conference proceedings 2007-2012**


**Extension Publications 2007-2012**

**Popular Press Articles 2007 -2012**
Texas experts hope citrus greening disease is not widespread
AgriLife Today January 18, 2012
Citrus experts: Get informed about citrus greening
AgriLife Today January 26, 2012
Diseased South Texas citrus trees destroyed
AgriLife Today February 9, 2012
Rains wreak havoc on South Texas onion crop
AgriLife Today April 19, 2012
South Texas winery beating the odds
AgriLife Today June 28, 2012
Extension expert: China shipping more food products to U.S.
AgriLife Today July 20, 2012
Lower Rio Grande Valley’s first winery slates open house
AgriLife Today September 4, 2012
Disease and Weed Control New technologies lead to efficient herbicides and fungicides
Growing Magazine March 2012
Citrus greening quarantine unchanged in Texas Valley
Southwest Farm Press January 30, 2012
South Texas update: beneficial rains, damaging hail storms
Southwest Farm Press June 4, 2012
Citrus Greening Disease Has Growers on Alert
Texas citrus officials remain hopeful, despite greening find
The Grower January 18, 2012
Texas officials hope they’ve caught citrus greening early
The Grower February 21, 2012
Texas Co-op Power Magazine July 2012
Texas onion acreage leaps, crop escapes winter damage
Produce News Daily March 9, 2011
AgriLife Extension, others offer small-acreage grower business series
AgriLife News March 24, 2011
New food safety site caters to farmers
AgriLife News April 21, 2011
Water quality critical for food safety
Southwest Farm Press May 20, 2011
Market for onions still fresh
Country World News June 21, 2011
Tropical storm could be godsend
Weak markets push down South Texas acreage
AgriLife News November 11, 2011
Texas vegetables enduring worst drought in 50 years
Produce News Daily November 18, 2011
Mexican drug violence could help South Texas onion farmers
Ag News November 24, 2010
Area producers receive food safety training in Uvalde
Ag News October 19, 2010
Spiders and pumpkins and bats, oh my!
Ag News October 13, 2010

Keeping Vegetables Safe: $1 million grant will seek ways to reduce pathogen
Ag News August 6, 2010

Rio Grande Valley row crops vulnerable to Alex
Ag News June 29, 2010

South Texas onion growers grin as prices soar
Ag News May 28, 2010

Ag-related classes, conferences start soon in South Texas
Ag News January 21, 2010

Anciso receives Superior Service Award from Texas AgriLife Extension Service
Ag News January 8, 2010

Peppers’ nutritional punch, popularity highlight conference
Ag News November 05, 2009

Rains and El Niño Help Texans Look Beyond Drought
Wall Street Journal Online October 03, 2009

Rains help break heat wave in deep South Texas
Ag News September 03, 2009

South Texas drought devastating crops
Ag News June 09, 2009

Insect mystery boon to Texas onion harvest
Ag News April 06, 2009

Staples leads initiative to help farmers
Jack County Herald March 10, 2009

Drought-Proofing the Valley
The Business Times February 26, 2009

Rio Grande Valley Horticultural Society to address threats, opportunities
Ag News Jan. 16, 2009

Electronic media/software (websites, videos, etc.) 2007-2012
Contribute to three websites:
GAPs Food Safety Website - agrilifefoodssafety.tamu.edu
Local Produce and Small Acreage Website - texaslocalproduce.tamu.edu
Statewide Watermelon Variety Trial Website - aggie-horticulture.tamu.edu/vegetable/variety-trials/statewide-watermelon-trials/

Smart Phone app for food safety:

Interagency and interdisciplinary program participation 2007-2012
Texas Legislature - Committee Meeting of Senate Public Health Committee on Food Safety of Produce. SB 81. September 23, 2010. Austin, Texas

Texas Legislature - Joint Hearing of House Public Health Committee and House Intergovernmental Affairs Border Committee on Food Safety. August 26, 2010. Austin, Texas

FDA - Food Safety Listening Session on Food Safety. April 27, 2010. San Antonio, Texas


Texas Legislature – Committee Meeting of Agriculture and Rural Affairs. HB 1908. April 20, 2009. Austin, Texas

Graduate student’s committee member 2007-2012
Sang Shin Park. Current student. Ph.D. Microbial contamination in spinach at the pre-harvest level as affected by farm management and environmental factors. College of Veterinary Medicine and Biomedical Sciences. Texas A&M University. (Dr. Renata Ivanek advisor).


First job taken by graduate students 2007-2012
Adrianna Ochoa – County Extension Agent for Armstrong County. Texas A&M AgriLife Extension

Grants and contracts awarded (competitive and non-competitive) 2007-2012

$2,000  Agraquest funding for insecticide trial in onions 2012.
$4,000  Gowan Corporation funding for insecticide trial in onions 2012.
$6,000  Marrone Bio funding for fungicide trial in onions 2012.
$1,000  Luxemburg Corporation funding for fungicide trial in onions 2012.
$7,000  Syngenta Corporation funding for fungicide trial in cantaloupes 2012.
$4,000  FMC Corporation funding for fungicide trial in honeydews 2012.
$8,500  Gowan Corporation funding for fungicide trial in honeydews 2012.
$6,000  Marrone Bio funding for fungicide trial in honeydews 2012.
$1,000  Grow More funding for trial in grapes 2012.
$5,600  Abbott and Cobb Seed funding for statewide watermelon variety trial 2012.
$1,750  Seminis Seed funding for statewide watermelon variety trial 2012.
$1,050  Syngenta/Rogers Seed funding for statewide watermelon variety trial 2012.
$1,050  Willhite Seed funding for statewide watermelon variety trial 2012.
$1,050  Zeriam Gedera funding for statewide watermelon variety trial 2012.
$2,500  Speedling Incorporated funding for greenhouse watermelon trials 2012.
$1,000  HEB funding for GAPs food safety workshop to produce vendors 2012.
$500  Texas Vegetable Association funding for food safety conference 2012.
$2,000  BASF funding for fungicide trial in summer squash 2011.
$6,000  Gowan Corporation funding for fungicide trial in summer squash 2011.
$1,050  Syngenta/Rogers Seed for statewide watermelon variety trial 2011.
$3,500  Abbott and Cobb Seed for statewide watermelon variety trial 2011.
$1,400  Seminis for statewide watermelon variety trial 2011.
$1,400  Willhite Seed for statewide watermelon variety trial 2011.
$1,400  Zeriam Gedera for statewide watermelon variety trial 2011.
$1,615  Speedling Incorporated funding for greenhouse watermelon trials 2011.
$2,000  HEB funding for GAPs food safety workshop to produce vendors 2011.
$4,000  USDA-NIFA-SCRI grant “Novel methods for control of microbial contamination in spinach in Texas and Colorado” (R. Ivanek PI, 2011) 2 year study with total grant award of $299,874.
$10,097  TDA-SCBG grant “Produce food safety conference and workshops” (awarded to Texas Vegetable Association, 2011) with total grant award of $60,000.
$23,469  USDA Citrus Greening grant “Commercial citrus producers education and training on citrus greening” (M. Dozier P.I., 2011) 2 year study with total grant award of $183,040.
$18,500  USDA-NIFA-SCRI grant “Impacts of Evolving Food Safety Standards on the Sustainability of Small- and Medium-Size Produce Farms: Implications for Implementation of the FDA Food Safety Modernization Act” (L. Ribera P.I., 2011) 2 year study with total grant award of $408,472.
$11,000  Syngenta Corporation funding for herbicide trial in watermelons 2010
$2,200  Gowan Corporation funding for fungicide trial in watermelons 2010
$3,850  Syngenta/Rogers Seed for statewide watermelon variety trial 2010.
$700  Shamrock Seed for statewide watermelon variety trial 2010.
$4,200  Abbott and Cobb Seed for statewide watermelon variety trial 2010.
$1,400  Seminis for statewide watermelon variety trial 2010.
$2,100  Willhite Seed for statewide watermelon variety trial 2010.
$700  Zeriam Gedera for statewide watermelon variety trial 2010.
$4,000  HEB funding for GAPs food safety workshop to produce vendors 2010.
$9,250  USDA-NIFA-SCRI zebra chip mini-grant “Spray Coverage and Insecticide Performance for potato psyllid in commercial potato fields” (C. Nansen PI, 2010) with a total grant award of $40,000.
$177,983  USDA-NIFSI-SCRI grant “Role of surface-related factors on contamination and survival of pathogens in fresh produce grown in Texas and Mexico - Produce food safety-systems approach” (E. Murano PI, 2010) 3 year study with a total grant award of $999,190.
$10,000  Gowan Corporation funding for fungicide trial in watermelons 2009.
$4,000  Valent Corporation funding for fungicide trial in watermelons 2009.
$4,000  Grow More funding for fungicide trial in watermelons 2009.
$ 2,450  Syngenta/Rogers Seed for statewide watermelon variety trial 2009.
$ 1,050  Shamrock Seed for statewide watermelon variety trial 2009.
$ 3,850  Abbott and Cobb Seed for statewide watermelon variety trial 2009.
$ 1,050  Harris Moran for statewide watermelon variety trial 2009.
$ 2,100  Willhite Seed for statewide watermelon variety trial 2009.
$ 700  Hazera for statewide watermelon variety trial 2012.
$ 4,000  HEB funding for GAPs food safety workshop to produce vendors 2009.
$ 1,200  USDA IR-4 grant for fungicide trials in leafy greens 2009.
$95,682  TDA-SCBG grant “Produce Safety in Texas: A Systems Approach (GAPs Curriculum, Website, and Conference)” (J. Anciso and J. Masabni PI’s, 2009) with a total award of $181,500.
$45,000  USDA-NIFA-SCRI “Marketing and Risk Management for Horticultural Producers in Texas” (L. Ribera PI, 2009) 3 year study with a total grant award of $298,735.
$ 6,000  DuPont Corporation funding for fungicide trial in onions 2008.
$ 3,000  Valent Corporation funding for fungicide trial in onions 2008.
$ 8,000  Syngenta Corporation funding for insecticide trials in cabbage and cantaloupes 2008.
$ 3,850  Syngenta/Rogers Seed for statewide watermelon variety trial 2008.
$ 1,400  Shamrock Seed for statewide watermelon variety trial 2008.
$ 3,500  Abbott and Cobb Seed for statewide watermelon variety trial 2008.
$ 1,400  Harris Moran for statewide watermelon variety trial 2008.
$ 2,000  HEB funding for GAPs food safety workshop to produce vendors 2008.
$92,000  TDA-SCBG grant “Field Certification of Good Agricultural Practices (GAPs) in Texas” (J.Anciso PI, 2008) with a total grant award of $92,000.
$ 5,000  BASF Corporation funding for insecticide trial on cabbage 2007.
$ 1,500  Grow More funding for fungicide trial on onions 2007.
$ 5,000  Syngenta Corporation funding for fungicide trial on peppers 2007.
$ 3,850  Syngenta/Rogers Seed for statewide watermelon variety trial 2007.
$ 700  Zeriam Gedera for statewide watermelon variety trial 2007.
$ 2,800  Abbott and Cobb Seed for statewide watermelon variety trial 2007.
$ 1,400  Willhite Seed for statewide watermelon variety trial 2007.
$ 2,000  HEB funding for GAPs food safety workshop to produce vendors 2007.
$ 9,811  USDA IR-4 grant for fungicide trial in leafy greens 2007.
$ 2,500  TDA grant “Sampling of soil in potato fields for potato cyst nematode” a joint project with West Texas A&M (G. Schuster PI, 2007) with a total grant award of $15,000.

Grant review panel service and workshops 2007-2012
2012  USDA-SCRI Grants Writing Workshop and Regional Team Building Meeting – Atlanta, GA

Editorial boards on which you served 2007-2012
Subtropical Plant Science

Journals for which you reviewed papers 2007-2012
HortScience
Subtropical Plant Science

Internal university / agency service on committees 2007-2012
Committee member Minor Use Pesticide Advisory Committee (Dr. Mark Matocha) 2007 - present
Co-Chair with Dr. Monty Dozier for Fresh Produce Food Safety Task Group (Dr. Monty Dozier) 2007- present
Co-Chair with Dr. Joe Masabni for Produce Food Safety Initiative Task Force (Dr. Pete Gibbs) 2009 - present
Committee member Water Initiative Task Force (Dr. Pete Gibbs) 2009 - present
Committee member Multi-State Food Safety Committee (Dr. Elsa Murano) 2010 - present

Professional association leadership roles 2007-2012
Director Educational Section of Texas Vegetable Association  2009 – present
Secretary/Treasurer of Texas Vegetable Association  2006-2008
Section director for vegetables of the Subtropical Plant Science Society  
(previously Rio Grande Valley Horticultural Society) 2007- present  
Watermelon workgroup of American Society of Horticultural Science and Southern Region ASHS 2007- present

Awards and recognitions 2007-2012
2012 Texas A&M AgriLife Extension Superior Service - Team Category (HEB Produce Food Safety Course)  
2010 Vice Chancellor’s Award in Excellence – Specialist Category  
2010 Texas County Agricultural Agents Association Specialist of the Year  
2009 Texas AgriLife Extension Service Superior Service - Specialist Category
Michael Aloysius Arnold  
Professor of Landscape Horticulture and Associate Department Head for Graduate Programs  
ma-arnold@tamu.edu

Program Summary  
Dr. Arnold holds a three way split between teaching, research and administration. Teaching responsibilities include two undergraduate and two graduate courses in the field of plant materials and plant materials utilization in the landscape. He also serves as the chair of two Ph.D. student committees and as a member of about a dozen graduate student committees within and outside the Department. His research program involves investigations in three primary areas, two long-term and one short-term. Long-term projects include the selection and development of commercial genotypes from regionally native or well adapted species. Much of this program has been aimed at developing native genotypes tolerant of salinity, soil alkalinity, and drought exposure which could replace higher resource requiring species or exotic species which may pose an environmental threat through invasive tendencies. These efforts are highly integrated with extension programs through joint efforts with CEMAP (Coordinated Education and Marketing Assistance Program) and the Texas Superstar® program. The other closely related long-term project which is to investigate container nursery production practices and landscape establishment practices which minimize the resources required and losses of plants associated with landscape establishment of container grown plants. A third shorter term area of research operates as a fund generating effort capitalizing on short-term industry requested investigations associated with greenhouse, nursery, or plant establishment issues, for instance our recent cooperative efforts with a firm interested in adapting a traditional ornamental species for production of a cosmetic or pharmaceutical product. Dr. Arnold has also recently (October 2012) resumed duties as the Department’s Associate Head for Graduate Programs where he is charged with leading the Department’s efforts related to M. Agric., M.S., and Ph.D. degree programs. In a service capacity, Dr. Arnold holds or has recently held officer positions with the national level American Society for Horticultural Sciences and with the Southern Region ASHS, as well as positions on the editorial boards for HortTechnology and the Journal of Environmental Horticulture.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>1990</td>
<td>North Carolina State University</td>
<td>Horticulture</td>
</tr>
<tr>
<td>M.S.</td>
<td>1987</td>
<td>The Ohio State University</td>
<td>Landscape Horticulture</td>
</tr>
<tr>
<td>B.S.</td>
<td>1984</td>
<td>The Ohio State University</td>
<td>Landscape Horticulture</td>
</tr>
<tr>
<td>B.S.</td>
<td>1983</td>
<td>The Ohio State University</td>
<td>Production &amp; Operations Management</td>
</tr>
</tbody>
</table>

Professional Experience:

2012 – present  
Associate Head for Graduate Programs (30% administration), Dept. of Horticultural Sciences, Texas A&M University

2005-present  
Professor, Dept. Horticultural Sciences, Texas A&M University (2005-2012: 70 % teaching, 25% research, 5% service) After 2012: 50 % teaching, 15% research, 5% service)

2003-2007  
Associate Head for Research& Graduate Studies (5% administration), Dept. Horticultural Sciences, Texas A&M University

1997-2005  
Associate Professor of Landscape Horticulture, Texas A&M University (65% teaching, 30% research, 5% admin./service)

1993-1997  
Assistant Professor of Landscape Horticulture, Texas A&M University (75% teaching, 25% research)

1990-1992  
Assistant Professor of Ornamental Horticulture, Tennessee Tech. Univ. (18% teaching, 45% research, 37% outreach/service)

Publications 2007-2012

Referred Publications (underlined names indicate graduate students in the faculty members lab)


Popular press articles 2007-2012


Electronic media/software (websites, software, videos, etc.) 2007-2012

Maintain three class websites and contribute to the content of the graduate portion of our Departmental website:

HORT 306 website: http://aggie-horticulture.tamu.edu/syllabi/206/home/frameset.htm

HORT 308 website: http://aggie-horticulture.tamu.edu/syllabi/308/home/frameset.htm

HORT 608 website: http://aggie-horticulture.tamu.edu/syllabi/608/index.html

Graduate portion of HortSciences.tamu.edu website: http://hortsciences.tamu.edu/graduate-programs/

Books or chapters in books 2007-2012


Patents / plant variety releases / plant variety patents

Arnold, M.A. Texas Agricultural Experiment Station via Ball Horticulture & Pan American Seed. 2010. PVP No. 200600009 Helenium 'Dakota Gold' issued on 06/22/2010.
Classes taught (2007-2012)

Undergraduate courses

Graduate courses
Horticulture 691, Research, each semester year-round from Spring 2007 through Fall 2012 at Texas A&M University.

Graduate students (2007-2012)

Advised/co-advised
Garry V. McDonald. 2007. Ph.D. Ozone (O3) Efficacy on Reduction of Phytophthora capsici Leonian in Recycled Horticultural Irrigation Water. (Co-advised with Drs. Don Wilkerson and M.A. Arnold)
Alma Rosa Solís-Pérez. 2009. Ph.D. Characterizing Salinity Tolerance in Roses. (Co-advised with Drs. Raul

First job taken by each of your graduate students 2007-2012
Donita L. Cartmill (Donita L. Bryan, maiden name) – Assistant Professor, University of Wisconsin-Platteville
Geoffrey C. Denny – Assistant Professor, University of Florida, now Assistant Professor, Mississippi State University
Garry V. McDonald – Assistant Professor, University of Arkansas
Alma Rosa Solís-Pérez – Returned to a professorial position in Mexico, since moved to a research associate position at the Texas A&M University Research and Extension Center at Uvalde.

Graduate student committees (non-advisees)

Brett Doreck. M. Agric. student, Dept. of Plant Pathology and Microbiology, internship at Brazos Valley Tree Farm.
Myron "Mike" Gray. 2007. Ph.D. Dept. of Plant Pathology and Microbiology. The Use of Population Genetics to Test for Genetic Resistance to Oak Wilt in Live Oak.
Ben Hagood. Current M. Agric.. Student. Dept. of Soil and Crops, internship undefined.
Hayley Hannah. Current M.S. student, Dept. of Horticultural Sciences, project in development.


Sheila A. McBride. M.S. student, Department of Plant Pathology and Microbiology. Project on Pierce’s disease in grape in development.

Matthew A. McGinley. M.L.A. student, Dept. of Landscape Architecture and Urban Planning, project in development on caliche mine park in Alston, TX.

Julie Christine Rothe. M.S. 2010. Dept. of Soil and Crop Sciences. The Identification and Quantification of Leaf Mesophyll Oil Bodies During the Development of Native or Adapted Plant Species.


Mark Swapp. Current M.L.A. student Dept of Landscape Architecture and Urban Planning. Changed committee members due to a change in research projects.


Yi Xue. M.L.A. student, Dept. of Landscape Architecture and Urban Planning. A Comprehensive Master Plan for a 1,300 Acre Lake Methodist Conference Center (LMCC) in Anderson County, TX.


Interdisciplinary program participation (2007-2012)

None

Grants and contracts awarded 2007-2012


$605 Participation in the American Society for Horticultural Sciences Board Meeting. $605. Expenses reimbursed to Texas AgriLife Research by the American Society for Horticultural Sciences.


$400 Participation in Presentation of Texas Excellence in Landscaping (TEIL) Awards. Texas Nursery and Landscape Association. $224 cash for travel, plus room and meals in kind.

$8,000 Cutting Baldcypress Off At The Knees. J. Frank Schmidt Family Charitable Foundation. M.A. Arnold. $30,254 requested, funded for $8,000.

$2,000 Determination of drought tolerance and parentage of live oak (Quercus virginiana) and escarpment live oak (Quercus fusiformis) accessions for adaptation to demanding environments. $11,017. Tom’s Tree Place through Texas Tech University. C. McKenney, T. Montague, R. Wright, and D. Auld. (subcontract portion for M.A. Arnold $2,000).
<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
<th>Funding Source</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5,000</td>
<td>Development of trailing low water requiring perennials as hanging basket, groundcover, and patio planter crops. $5,000. Texas Ornamentals Enhancement Endowment. Michael Arnold (PI) and Garry McDonald (cooperator).</td>
<td>Texas Ornamentals Enhancement Endowment</td>
<td>M.A. Arnold (PI) and Garry McDonald (cooperator).</td>
</tr>
<tr>
<td>$7,500</td>
<td>Soil, irrigation, and production factors influencing establishment of container-grown trees at various planting depths. TREE Fund. M.A. Arnold (PI).</td>
<td>TREE Fund</td>
<td>M.A. Arnold (PI).</td>
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<tr>
<td>$500</td>
<td>Irradiance effects on the growth and inflorescences in four different Texas coastal species for potential commercial usage. $500. Experiential learning undergraduate research grant, TAMU Department of Horticultural Sciences. Funded.</td>
<td>Experiential learning undergraduate research grant, TAMU Department of Horticultural Sciences</td>
<td>Funded.</td>
</tr>
<tr>
<td>$7,865</td>
<td>Assessing field level cold tolerance in improved genotypes of <em>Taxodium distichum</em> tolerant of alkaline soils and drought. $7,441. TREE Fund. M.A. Arnold (PI).</td>
<td>TREE Fund</td>
<td>M.A. Arnold (PI).</td>
</tr>
<tr>
<td>$30,000</td>
<td>Maintenance funding to sustain the Horticulture Gardens during transition to physical plant control. $30,000. Internally funded by the Dean’s Office in the Texas A&amp;M University College of Agriculture and Life Sciences. Funded.</td>
<td>Internally funded by the Dean’s Office in the Texas A&amp;M University College of Agriculture and Life Sciences</td>
<td>Funded.</td>
</tr>
<tr>
<td>$2,291</td>
<td>2011 License agreement between Ball Horticultural Company and the Texas A&amp;M University System for <em>Helenium amarum</em> selections (TAMUS 1699) – Dr. Michael Arnold.</td>
<td>License agreement between Ball Horticultural Company and the Texas A&amp;M University System</td>
<td>M.A. Arnold (PI).</td>
</tr>
</tbody>
</table>

**Review panels for grants and journals**

Grant review panel service 2007-2012

None.

**Editorial boards on which you served 2007-2012**

*HortTechnology*

*Journal of Environmental Horticulture*
Journals for which you reviewed papers 2007-2012

*Arboriculture and Urban Forestry* (formerly *Journal of Arboriculture*)
*Journal of the American Society for Horticultural Sciences*
*HortScience*
*HortTechnology*
*Journal of Environmental Horticulture*

Internal university / agency service on committees 2007 – 2012

Texas A&M University Tree Advisory Committee, 2010 – present.
Texas A&M University Evaluation Committee for the Association of Former Students Distinguished Achievement Awards for 2010.
TAMU Department of Horticultural Sciences Outcome Assessment Committee, 2008 – present.
TAMU Department of Horticultural Sciences Farm Operations Advisory Committee, 2011 – present
TAMU Department of Horticultural Sciences Greenhouse Operations Advisory Committee, 2011 – present
TAMU Department of Horticultural Sciences Undergraduate Curriculum Committee, member 2011.
TAMU Department of Horticultural Sciences Garden Steering Committee, member 2010 – 2011.
TAMU Department of Horticultural Sciences Mentoring Committee for Dr. Joseph Masabni on the College Station Campus, 2009 – present.
TAMU Department of Horticultural Sciences Mentoring Committee for Dr. Xin Wang Wang at the Dallas Research Station, 2009 – present.
TAMU Department of Horticultural Sciences Mentoring Committee for Dr. Astrid Volder on the College Station Campus, 2006 – present.
TAMU Department of Horticultural Sciences Plant Diagnostics at a Distance, member 2000 - present.
TAMU Department of Horticultural Sciences Outcome Assessment Committee, 2008 – present.
TAMU Department of Horticultural Sciences Budget Committee, 2009-2011.
Texas AgriLife (TCE/TAES) Executive Committee of the Coordinated Education and Marketing Assistance Program (CEMAP), member 1999 – present; chair 2003 - 2009.
Texas AgriLife Research (TAES) Mentor Committee for a Dr. Genhua Niu faculty member at the El Paso Research Station, 2004 – present.
TAMU College of Agriculture and Life Sciences Tom Slick Fellowship Evaluation Committee, member 2005-present.
TAMU College of Agriculture and Life Sciences Horticultural Sciences Department Head Search Committee, member 2012.
TAMU College of Agriculture and Life Sciences Tenure and Promotion Committee, 2009-2011.
TAMU College of Agriculture and Life Sciences Association of Former Students Teaching Award (College-level), 2008.
TAMU College of Agriculture and Life Sciences Graduate Program Council, 2003 – 2007 and 2012 - present.

Professional association leadership roles 2007-2012

Served on the American Society for Horticultural Sciences (ASHS) Board of Directors, 2011 – present.
Served as a member of the *HortTechnology* Editorial Board, 2011 – present.
Served as a member of the ASHS Fellows Selection Committee, 2011 -2013.
Member of the ASHS Nominations and Elections Committee, Education Division Representative 2006 – 2009.
Served as a member of the SR-ASHS Executive Committee, member 2003 – 2011; chair 2009.
Served as a member of the SR-ASHS Smeal Senior Leadership/Administration Award Committee, member 2012-present.
Served as a member of the SR-ASHS J. Creighton Miller, Jr. Distinguished Educator Award Committee, 2010-2012, chair 2012.
Served as a chair of the SR-ASHS Masters oral paper competition section, 2010.
Served as a chair of the SR-ASHS Ph.D. oral paper competition section, 2010.
Served as a chair of the SR-ASHS Collegiate Branch Section, 2009.
Served as a member of the SR-ASHS L.M. Ware Distinguished Teacher Award Committee/J. Creighton Miller, Jr.
TNLA Best of Texas Task Force, 2011-2012
Advisor to the TNLA Landscape Committee, 2007 – 2009
Landscape Plant Development Center Board of Directors, 2007-2008
Landscape Plant Development Center Plant Introduction Committee and Research Committee, 2007-2008
Member of the Southern Region ASHS L.M. Ware Distinguished Teacher Award Committee/J. Creighton Miller, Jr. Distinguished Educator Award Committee, 2004 – 2007, chair 2006-2007
Chair of the Southern Region ASHS Collegiate Branch Section, 2009
Chair of the Southern Region ASHS Ph.D. oral paper competition section, 2010
Chair of the Southern Region ASHS Masters oral paper competition section, 2010
Texas Invasive Plant & Pest Council Board, member 2009 - 2012.

Awards and recognitions 2007-2012
Inducted as a Fellow of the American Society for Horticultural Sciences in 2010.
Received the 2009 Vice Chancellor’s Award in Excellence for Undergraduate Teaching, highest teaching award in the Texas A&M University College of Agriculture and Life Sciences.
Received the 2009 Southern Region of the American Society for Horticultural Science J. Creighton Miller, Jr. Distinguished Educator Award (the organization’s highest teaching award).
Received a 2007 Association of Former Students Distinguished Achievement Award for Teaching at the College-Level.
David Hawkins Byrne
Professor, Prunus and Rosa Breeding and Genetics
dbyrne@tamu.edu

Program Summary
The thrust of the applied plant improvement work is breeding for adaptation: disease resistance, consistent yield and fruit quality under mild winter conditions in stone fruit, and disease (black spot, powdery mildew) resistance, heat tolerance, compact plant form, thornlessness and a range of colors and flower forms in landscape rose breeding. In addition, a strong effort is made to collect useful plant material from throughout the world.

Horticultural traits being introgressed into the low chill stone fruit breeding population include high sugars, low acidity, white/orange/red flesh, high firmness, flat fruit shape, and nectarine. My work with the RosBREED project focuses on the inheritance of high sugar content in peaches and nectarines. I have planted the same progenies in both California and Texas to ensure that these are well phenotyped and we can estimated the GxE interaction for the range of traits that we will measure.

I am developing a joint breeding and research program with the fruit breeding Program at EMBRAPA Clima Temperado to better use our facilities and germplasm to develop fresh market peach and nectarine varieties and to do research in the areas of climatic restrictions of stone fruit production, embryo rescue techniques, and the health benefits of stone fruit consumption. Additional collaborative breeding efforts are being pursued with CLONE in Brazil and Vinedos Alta SA de CV, Hermosillo, Sonora, Mexico.

I also do collaborative work with Dr. Cisneros, Porter, Talcott, and Turner on the health benefits of stone fruit. We have looked at the levels of phytochemicals, antioxidant activity and the effects of extracts on cancer (breast and colon) proliferation, LDL oxidation, platelet aggregation, and inflammation.

With roses the breeding is done independently at the diploid and tetraploid levels. On the diploid level the excellent sources of black spot resistance derived from once blooming species are introgressed into the disease susceptible everblooming germplasm to develop recurrent blooming black spot resistant genotypes with the best possible bush type and flower characteristics. On the tetraploid level, black spot resistant types are crossed with genotypes with superior bush and flower characteristics. The third breeding program is the diploid to tetraploid introgression. This is to incorporate the generally superior disease resistance from the diploid species into the tetraploid germplasm which has superior horticultural and flower characteristics. This is done via direct crosses and/or by doubling the chromosomes of the diploid selections before crossing into the tetraploid germplasm. Currently we are evaluating the large Moore rose collection (~800 genotypes) that was donated to Texas A&M University to determine its usefulness in breeding as well as commercially. Ongoing graduate student projects include the determination of ploidy levels of rose germplasm, effectiveness and subsequent ploidy levels of seedlings from crosses using a triploid pollen parent, screening techniques, mapping and marker discovery for heat tolerance, black spot resistance and the length of the flowering cycle, and the response of rose roots to heat stress. I am training my doctoral graduate students in the use of Pedimap and FlexQTL as we plan to use this technology in their graduate work.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>1980</td>
<td>Cornell University</td>
<td>Plant Breeding and Biometry</td>
</tr>
<tr>
<td>B.S.</td>
<td>1975</td>
<td>Rutgers University</td>
<td>Plant Science</td>
</tr>
</tbody>
</table>

Professional Experience:

2007-2012   Associate Head for Research& Graduate Studies (5% administration), Dept. Horticultural Sciences, Texas A&M University
Robert E. Basye Endowed Chair in Rose Genetics
Fulbright Scholar. Fruit and Ornamental Breeding at the Universidade Federal de Pelotas and EMBRAPA, Pelotas, RS, Brazil.
Professor, Department of Horticultural Science, Texas A&M University (35% teaching, 65% research) 2004-present

1997   Associate Professor, Department of Horticultural Science, Texas A&M University (35% teaching, 65% research) 1989-

1983-1989  Assistant Professor, Department of Horticultural Science, Texas A&M University (35% teaching, 65% research) 1981-

1983   Plant Breeder, Research Scientist, International Plant Research Institute, Inc., San Carlos, CA
Publications 2007-2012

Referred Publications (*underlined names indicate graduate students in the faculty members lab*)


Editor reviewed publications or conference proceedings 2007-2012


**Popular press articles 2007-2012**

Peaches by Design. June 6, 2007. Written by Peggy Grodinsky, based on interview with David Byrne, Houston Chronicle feature article in Food Section.

Plums poised to give blueberries run for the money. January 28, 2009. Written by Kathleen Phillips. Luis Cisneros and David Byrne. Research. This news release generated articles in many newspaper and magazines.


Well-adapted and gorgeous, roses vie for top billing in Texas breeding program. Article and video prepared by Kathleen Phillips. November 17, 2010. David Byrne

Rose torture: severe heat in Texas yields better varieties for research. Article and video prepared by Kathleen Phillips. December, 2011. David Byrne. This press release generated articles in the major gardening magazines as well as an interview on television at the local television station.


**Electronic media/software (websites, software, videos, etc.) 2007-2012**

Maintain two class websites, two research web sites, and the Rose Program Facebook page:

HORT 319 website: http://aggie-horticulture.tamu.edu/syllabi/319/home/frameset.htm

HORT 423 website: http://aggie-horticulture.tamu.edu/syllabi/423/home/frameset.htm

Peach Breeding and Genetics website: http://aggie-horticulture.tamu.edu/stonefruit/

Rose Breeding and Genetics Facebook page: http://www.facebook.com/tamuroses

Rose Program listserve: This is to send out updates about the Rose Breeding and Genetics Program to about 1,000 email addresses.

**Books or chapters in books 2007-1012**


**Patents / plant variety releases / plant variety patents**


Classes taught (2007-2012)

Undergraduate courses
Horticulture 491, Problems in Horticulture: Fall/Spring 2010, and Fall/Spring 2012

Graduate courses
Horticulture 691, Research, each semester year-round from Spring 2007 through Fall 2012 at Texas A&M University.

Graduate students (2007-2012)

Advised/co-advised

Current students:
Tim Hartmann, M.S. Heritability and Combining Ability for Fruit Quality Traits in Prunus persica (L.) Batsch, Began Fall 2009. Estimated graduation December 2013.

First job taken by each of your graduate students 2007-2012
Guiliana Noratto – Assistant Research Scientist, Nutrition & Food Science, Vet. Physiology & Pharmacology working with Dr. Talcott, Texas A&M University. Currently an Assistant Professor with the Food Science Department at Washington State University
Natalie Anderson – Research Associate, Department of Horticultural Sciences, Texas A&M University.
Valerie Eitriem – Married.
Matt Orwat - Extension Agent, Horticulture, UF / IFAS Washington County Extension, 1424 Jackson Ave., Suite A., Chipley Fl. 32428-1628

Graduate student committees

Visiting Scientists
Dr. Ruidan Chen, a professor at the Beijing Forestry University to work in the research area of peach and rose genetic diversity (Dec. 2007 – Jan 2009).

Anil Shukla, a scientist from India who was at TAMU for 6 weeks (Feb-March 2009) on a Borlaug Scholarship.
Amjad Farooq, a Ph.D student at the University of Agriculture, Faisalabad, Pakistan. He did microsatellite research on the genetic diversity of *Rosa damascena* which is part of his dissertation project (August 2009 to February 2010).

Saowanee Kongsri, a Ph.D student from Kasetsart University in Bangkok, Thailand. She spent 8 months here and performed experiments on the tolerance of *Prunus* rootstocks to drought and soil acidity (October 2010 to June 2011). We collaborated with Dr. Lombardini on this project.

Hui Feng, a Ph.D student from Beijing Forestry University, Beijing, PRC. She spent 6 months (January 2011 – June 2011) studying rose diversity and breeding.

Jihong Hu, a Stone Fruit Breeder from the Forestry and Fruit Research Institute, Shanghai Academy of Agricultural Sciences in Shanghai, China. She spent 6 months (March 2012 to August 2012) working with me in the Prunus Breeding and Genetics program.

Xiaonan Yu, a peony breeder from the Beijing Forestry University, Beijing, China. She will stay for 6 months (August 2012 to February 2012) and will work in the area of ornamental research.

Gulzar Aktar, Ph.D student at the University of Agriculture, Faisalabad, Pakistan. He did microsatellite research on the genetic diversity of *Rosa centifolia* which is part of his dissertation project (January 2013 to July 2013).

Silvia Carpenedo, Ph.D student at the Universidade Federal de Pelotas, Rio Grande do Sul, Brazil. She is studying heat tolerance in peach. (January 2013 to January 2014).

**Interdisciplinary program participation (2007-2012)**

Member of the Plant Breeding faculty

**Grants and contracts awarded 2007-2012**

- **$50,000** License agreement Selecciones Donana for testing and commercialization of Prunus selections from Prunus Breeding and Genetics Program. Funded at $10,000 per year. 2007-2011.
- **$6,000** License agreement Burchell Nursery for testing and commercialization of Prunus selections from Prunus Breeding and Genetics Program. Funded $1,000 per year. 2007-2012. This company also maintains a peach experimental orchard and facilitates the production of hybrid seed for the breeding effort.
- **$30,000** License agreement PICO, Modern Agriculture Company for testing and commercialization of Prunus selections from Prunus Breeding and Genetics Program. Funded at $5,000 per year. 2007-2012.
- **$6,000** License agreement CLONE Viveiros for testing and commercialization of Prunus selections from Prunus Breeding and Genetics Program. Funded at $1,000 per year. 2007-2012.
- **$25,000** License agreement Colors Fruit (South Africa) for testing and commercialization of Prunus selections from Prunus Breeding and Genetics Program. Funded at $5,000 per year. 2007-2012.
- **$50,000** License agreement Grupo Alta (Mexico) for testing and commercialization of Prunus selections from Prunus Breeding and Genetics Program. Funded at $10,000. 2007-2012.
- **$2,700** Texas Fruit Growers Association. Travel expenses to evaluate the breeding plots in Floresville, Terrel, and Fairfield. Funded $2,700.
- **$135,900** SCRI. RosBREED: Enabling marker-assisted breeding in Rosaceae. Iezzoni et al., $14,400,000 over 4 years. Byrne funding, $135,900. 2010-2013.
- **$9,500** California Fruit Tree Agreement. Supplement to High Sugar Studies with RosBREED. Byrne, Ramming, Slaughter and Gaarde. $9,500. 2010-2011.
- **$5,500** California Fruit Tree Agreement. Promoting stone fruits for Protection against the Metabolic Syndrome Funded for $49,708. Byrne ($5,500) and Cisneros ($44,208, joint post doctoral student and supplies for work in his laboratory). 2010-2011.

$5,500  California Fruit Tree Agreement. 2009-2010. Cardiovascular health benefits of peaches and plums. Funded for $49,708. Byrne ($5,500) and Cisneros ($49,708, joint post doctoral student and supplies for work in his laboratory)


$100,000  Moore Donation to the program. $100,000 plus rose germplasm and IP rights.

$5,000  California Fruit Tree Agreement. 2008-2009. Health benefits of peaches and plums. Funded for one year. $42,141. Byrne ($5,000) and Cisneros ($37,141).


**Review panels for grants and journals**

**Grant review panel service 2007-2012**

None.

**Editorial boards on which you served 2007-2012**

*none*

**Journals for which you reviewed papers 2007-2012**

*Journal of the American Society for Horticultural Sciences*
*HortScience*
*HortTechnology*
*Phytopathology*
*Euphytica*
*Scientia Horticulturae*
*Theoretical and Applied Genetics*

**Internal university / agency service on committees 2007 – 2012**

USDA Program review for the Designing Foods for Health program at the VFIC. 2009

Participate in Horticulture Industry Advisory Meetings (2008-2011)

Search Committee for Graduate Advisor for the Department. 2010.

Participated in the VFIC SWOT analysis. 2012

Chair of Horticulture Farm Committee (2007-2012). Department of Horticultural Sciences.

Member of the Plant Review Committee (COALS) which is responsible to review all plant release proposals.

Various other committees as needed.

**Professional association leadership roles 2007-2012**

Serve on scientific organizing committee of the International Rose Symposium, Hannover, Germany in August 2013.

Serve on the scientific organizing committee of the International Symposium on Temperate Fruit in the Subtropics and Tropics to be held in Changmai, Thailand in March 2013.

*Prunus* Crop Germplasm Committee

Chairperson (1995-2008) and member of executive committee (1990 – 2008)


Chair Peach Crop Committee (1995 – 2008)

International Rose Genomics Executive Committee (2007 – present)

RosBREED Executive Committee. 2012-present.

Technical Advisory Committee. Buck Rose Collection, Reiman Gardens, Ames, Iowa

Served on the scientific organizing committee of the International Rose Symposium held in Gifu, Japan. May 2009.
Awards and recognitions

Robert E. Basye Endowed Chair in Rose Genetics. 2004 - present

Honorary Scientist of the Zhengzhou Fruit Research Institute, Peach Breeding and Germplasm, Zhengzhou, Henan, People’s Republic of China

Fulbright Scholar, August 2004 – February 2005. Fruit and Ornamental Breeding at the Universidade Federal de Pelotas and EMBRAPA, Pelotas, RS, Brazil.

Ulysses P. Hedrick Award given by the American Pomological Society for best paper in the competition. Co author.
Raul I. Cabrera  
Associate Professor of Ornamental Horticulture  
r-cabrera@tamu.edu

Program Summary
Dr. Cabrera conducts research on ornamental plant and crop physiology, mineral nutrition, fertilization and water management in intensively managed plants and crops (including nursery, floriculture, landscape, arboriculture). Research emphasis deals with water quality and crop salinity tolerance, landscape water use and conservation, hydroponics and fertigation management; characterization of nutrient/water uptake and use efficiency in ornamental crops and landscape plants. Current research projects include optimization of flower crop mineral nutrition and environment and their effects on cut flower (roses, heliconias) productivity and quality, graywater as a potential alternative to landscape irrigation and conservation, characterization of water/nutrient use in mistletoe-infested urban trees. He also maintains activities and collaborative projects with colleagues at international universities and institutes, and he is often invited to give seminars, lectures and participate in extension/educational activities with students, growers, horticulturists and arborists in various countries. Dr. Cabrera holds or has recently held several editorial positions (Scientia Horticulturae, Acta Horticulturae, Revista Chapingo- Serie Horticultura, Revista Colombiana de Ciencias Hortícolas) and participates with peer-reviewer activities (HortScience, HortTechnology, J. Amer. Soc. Hort. Sci., J. Hort. Sci. & Biotech. etc.).

Academic Background

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<th>Degree</th>
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<th>Institution</th>
<th>Major</th>
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<tr>
<td>Ph.D.</td>
<td>1994</td>
<td>University of California at Davis</td>
<td>Plan Biology</td>
</tr>
<tr>
<td>M.S.</td>
<td>1992</td>
<td>University of California at Davis</td>
<td>Plant Physiology</td>
</tr>
<tr>
<td>B.S.</td>
<td>1986</td>
<td>Universidad Agraria Antonio Narro (Mexico)</td>
<td>Horticultura</td>
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Professional Experience:
2012-present  Associate Professor of Ornamental Horticulture, Texas A&M AgriLife Research and Extension Center at Uvalde (100% research)
1999-2012  Associate Professor of Woody Ornamental Horticulture, Texas A&M AgriLife Research and Extension Center at Dallas (100% research)
1994-1999  Extension Specialist and Assistant Professor of Nursery Crops Management, Rutgers, The State University of New Jersey (75% extension, 25% research)
1988-1993  Research and Teaching Assistant, Dept. of Environmental Horticulture, Univ. of California- Davis

Publications 2007-2012

Refereed Publications (underlined names indicate graduate students in the faculty members lab)


Editor reviewed publications or conference proceedings 2007-2012


**Popular press articles 2007-2012**


**Electronic media/software (websites, software, videos, etc.) 2007-2012**

Has contributed to electronic publications produced by the International Society of Arboriculture:

International Society of Arboriculture. 2007. *Introducción a la Arboricultura: Diagnóstico y Desórdenes (Introduction to Arboriculture: Diagnosis and Disorders)*. Educational CD (6 CEU). R.I Cabrera entirely responsible for the translation and technical adaptation of the Spanish version of the CD.


**Books or chapters in books 2007-1012**


Patents / plant variety releases / plant variety patents
N/A

Classes taught (2007-2012)
N/A

Graduate students (2007-2012)
Advised/co-advised
John Jairo Franco-Hermida. Current PhD student (Co-advising with Dr. M. Guzman). Herramientas de diagnóstico nutricional para el cultivo rosa bajo invernadero y con gestion de fertirriego (Nutritional diagnostic tools for greenhouse rose crops grown with managed fertigation). Graduate Program in Protected Agriculture, Universidad de Almería, Spain

First job taken by each of your graduate students 2007-2012
John Jairo Franco-Hermida – Technical Advisor and Flower Crop Consultant, Grupo Chia, Colombia
Alma Rosa Solís-Pérez – Returned to a professorial position in Veracruz, Mexico (2009-2012), now on a research assistant position at the Texas A&M AgriLife Research and Extension Center at Uvalde.

Graduate student committees (non-advisees)

Interdisciplinary program participation (2007-2012)
N/A

Grants and contracts awarded 2007-2012


Review panels for grants and journals
Grant review panel service 2007-2012
N/A

Editorial boards on which you served 2007-2012
*Scientia Horticulturae*. Editorial Advisory Board Member, 1997-present
*Revista Chapingo- Serie Horticultura*. Editorial Board Member, 2008-present
*Proc. of Southern Nursery Assn. Research Conference*. Section Editor (Field Production), 2004-2007
*Revista Colombiana de Ciencias Hortícolas*. Scientific Committee Member, 2006-2012
*International Symposium on Soilless Culture and Hydroponics*. Scientific Committee and Editorial Team Member. 2011.
*Fifth International Symposium on Rose Research and Cultivation*. Scientific Committee and Editorial Team Member. 2009.

Journals for which you reviewed papers 2007-2012
*Scientia Horticulturae*
*HortScience*
*Acta Horticulturae*
*HortTechnology*
*Arboriculture and Urban Forestry*
*Revista Chapingo- Serie Horticultura*
*Journal of the American Society for Horticultural Sciences*
*Journal of Horticultural Science & Biotechnology*
*Ciencia Forestal en México*
Internal university / agency service on committees 2007 – 2012
Texas A&M AgriLife at Dallas and Dept. Horticultural Sciences - Chair, Search Committee for Ornamental Plant Development Horticulturist. 2008.
Texas A&M AgriLife Research and Extension Center at Dallas – Chair, Greenhouse Facilities Committee, 2009-2010
Texas A&M AgriLife Research and Extension Center at Dallas – Chair, Facilities Maintenance Committee. 2006-2007
Texas A&M AgriLife Research and Extension Center at Dallas – Management Advisory Committee. 2005- 2007
Texas A&M AgriLife Research and Extension Center at Dallas – Housing Committee. 2002- 2007

Professional association leadership roles 2007-2012
Serving as Texas Representative for USDA Multistate Project NC1186: “Water Management and Quality for Ornamental Crop Production and Health”. 2010-2015
Served as Chair of Floriculture, Ornamentals and Turf Section of Southern Region-ASHS, 2010.
Served as member of Hispanic Committee of International Society of Arboriculture, 2005-2010.
Served as member of Board of Directors of Trinity Blacklands Urban Forestry Council (TBUFC, Dallas). 2002- 2012.

Awards and recognitions 2007-2012
2008 Texas Environmental Excellence Award (Agriculture Category) from the Texas Commission on Environmental Quality (TCEQ) to the Rio Grande Basin Initiative Team of the Texas AgriLife Research and Texas AgriLife Extension Service. R.I. Cabrera was member (2001-2011) of RGBI’s Task 5: Urban Landscape and In-Home Water Conservation.
2007 President’s Volunteer Service Award presented by the President’s Council on Service and Civic Participation and the White House, Washington, DC. For service as Invited Expert Volunteer on USAID program (Farmer-to-Farmer) in El Salvador.
Luis Cisneros-Zevallos, Ph.D.
Associate Professor
lcisner@tamu.edu

Program Summary
Dr. Cisneros-Zevallos holds a two-way split between teaching and research. Current teaching responsibilities include one undergraduate and two graduate courses in the fields of postharvest physiology and food processing. He serves as the chair/co-chair of two Master’s and four Ph.D. student committees and as a member of ten graduate student committees within and outside the Department.

Research interest includes two major areas, a) drug discovery of bioactive compounds with health promoting properties against chronic diseases from commercial and native crops and, b) post-harvest technology and biology of crops including the biosynthesis of secondary metabolites under stress conditions and the interaction between microorganisms and plant surfaces.

His research program has active collaborations with research institutions in the three major centers of plant biodiversity in Latin America, including the Andean region, the Amazon and Central America/Mexico. His courses at TAMU attract students from different fields including majors of Food Science, Horticulture, Nutrition and Ag Economics. In addition, his program has an active international component including invitations to give seminars and short courses in Europe, Asia and Latin America.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>1998</td>
<td>University of California, Davis</td>
<td>Food Science</td>
</tr>
<tr>
<td>M.S.</td>
<td>1995</td>
<td>University of California, Davis</td>
<td>Food Science</td>
</tr>
<tr>
<td>B.S., Eng.</td>
<td>1988</td>
<td>National Agrarian University - La Molina</td>
<td>Food Industries Engineering</td>
</tr>
</tbody>
</table>

Professional Experience
2004-present  Associate Professor, Department of Horticultural Sciences, Texas A&M University, College Station
1998-2004  Assistant Professor, Department of Horticultural Sciences, Texas A&M University, College Station
1992-1998  Research Assistant, Department of Food Science and Technology, University of California, Davis
1988-1991  Teaching Instructor, Department of Food Engineering, National Agrarian University – La Molina, Peru

Publications 2007-2012

Refereed Publications
Reyes L, Villarreal JE and Cisneros-Zevallos L. 2007. The increase in antioxidant capacity after wounding depends on the type of fruit or vegetable tissue. Food Chemistry 101:1254-1262
Vizzotto M, Cisneros-Zevallos L, Byrne D, Ramming D and Okie W. 2007. Large


Carrot Tissue Increases with Wounding Intensity. *Food Chem.* Accepted.

**Book chapters**


**Editor reviewed publications or conference proceedings 2007-2012**


**Popular press articles 2007-2012**

“El mensajero de lechugas a marte”. November 2, 2009. Written by Elisa Sanchez. Released by newspaper from Spain, Valencia page 8 (innovadores@elmundo.es). L Cisneros-Zevallos talks about research activities.

http://agnews.tamu.edu/showstory.php?id=950

http://www.youtube.com/watch?v=9Vn34Dpw64s

http://agnews.tamu.edu/showstory.php?id=1942

http://news.discovery.com/earth/plants/stressed-veggies-better-for-you.htm

http://today.agrilife.org/2012/06/18/peaches-plums-nectarines-give-obesity-diabetes-slim-chance/

**Classes taught (2007-2012)**

**Undergraduate courses**


HORT/FSTC 446, Commercial Fruit and Vegetable Processing: Spring 2010,
Graduate courses
HORT 644, Food Quality: Spring 2007, Spring 2009
HORT 630, Postharvest Biology and Technology: Spring 2013

Graduate students (2007-2012), Advised/co-advised
Giuliana Noratto, Ph.D. Food Science, 2008. (Co-Chair: D. Byrne)
Ana G. Ortiz-Quezada. M.S. Food Science, 2010. (Co-Chair: L. Lombardini)

Current students:
Facundo Ibanez. Ph.D. MEPS-Horticulture. (Co-Chair: L. Lombardini)
Jun Oh, Ph.D. Chemical Engineering (Co-Chair: Mustafa Akbulut)
Ming, Ph.D. Chemical Engineering (Co-Chair: Mustafa Akbulut)
Elisa Schreckinger, Ph.D. Food Science
Prerna Bhargava, MSc. Food Science
Fang-Mian Chang, MS. Horticulture

First job taken by each of your graduate students 2007-2012
Giuliana Noratto – Assistant Research Scientist, Nutrition & Food Science, Vet. Physiology & Pharmacology working with Dr. Talcott, Texas A&M University. Currently an Assistant Professor with the Food Science Department at Washington State University.

Ana G. Ortiz-Quezada. Research Associate, Tech de Monterrey, Monterrey, Nuevo Leon, Mexico.
Daniel Jacobo-Velazquez- Assistant Professor at the Tech de Monterrey, Monterrey, Nuevo Leon, Mexico.
Paula Simons- Internship at Kelloggs in Michigan.

Graduate student committees
Linda Wong, PhD, Expected F08, Department of Animal Sciences (FST)
Linda Dykes, PhD, Expected S08, Department of Soil and Crop Sciences (FST)
Malcom Gerngross, PhD, Expected F09, Department of Agricultural Engineering (FST)
Jaeeon Han, PhD, F07, Department of Biological & Agricultural Engineering (FST)
Jongsoo Kim, PhD, F07, Department of Biological & Agricultural Engineering (FST)
Carmen Gomes, PhD, Expected F09, Department of Agricultural Engineering (FST)
Numsa, PhD, F07, Department of Soil and Crop Sciences (FST)
Novie Alviola, MS, S07, Department of Soil and Crop Sciences (FST)
Kakani, MS, F07, Department of Animal Sciences (FST)
Amy Cafflin, PhD, F09, Department of Animal Sciences (FST)
Jay Neal , PhD. F08, Department of Animal Sciences (FST)
Maria Pia, MS, F07. Department of Animal Sciences (FST)
Ana Paola Cardenas, MS, F08. Department of Soil and Crop Sciences (FST)
Sara Guajardo, Ph.D. S08. Department of Soil and Crop Sciences (FST)
David Guajardo, Ph.D. F07. Department of Soil and Crop Sciences (FST)
Youngmok Kim, Ph.D. F08. Department of Nutrition and Food Science (FST)
Lizbeth Pacheco, Ph.D. F09. Department of Nutrition and Food Science (FST)
Nenge Linda, Ph.D. Expected F09. Department of Soil and Crop Sciences (FST)
Dilek Austin, Ph.D. F08, Department of Soil and Crop Sciences (FST)
Yolanda Nunez Gallegos, MS, F08, Department of Agricultural Engineering (FST)
Ezekiel Chimbmpibi, PhD, S09, Department of Agricultural Engineering (FST)
Dae Kceu Shin, Ph.D. F09, Department of Animal Sciences (FST)
Keila Perez, MSc, F10, Department of Animal Sciences (FST)
Megha Adavi, MSc, F11, Department of Animal Sciences (FST)
Liyi Yang, MSc, F10, Department of Soil and Crop Sciences (FST)
Megha Adavi, MSc, S11, Department of Animal Sciences (FST)
Keila Perez, PhD, F12, Department of Animal Sciences (FST)
Isin Karagoz, Ph.D., F12, Department of Agricultural Engineering
Georgia Barros, Ph.D., F12, Department of Agricultural Engineering

**Postdoctorals/Research assistants**
Dr. Vimal Nair (postdoctoral), S13- present
Dr. Woo Young Bang (postdoctoral), F12- present
Dr. Cong Mei Cao (postdoctoral), F09- summer 12
Freddy Ibanez, BS (research assistant). S10-Summer 12.
Paula Castillo, BS (research assistant), S10-S12.
Huiyong Ma, MS (research assistant), S10- summer 11.
Armando Del Follo, BS (research assistant), S08
Gabriela Angel, BS (research assistant), S08
Judith Rocha, BS. (research assistant), F06-S07
Alex Puerta, MS. (research assistant), S07-F09.

**Visiting Scientists**
Daniel Paredes, S07 (San Ignacio de Loyola University, Lima, Peru)
Fedele Colantuono, F07 (University of Foggia, Italy)
Alicia Siles, Summer 07 (University of Cordoba, Spain)
Carmen Melero, Summer 07 (University of Cordoba, Spain)
Eleni Pliakoni, F07 (University of Thessaly, Greece)
Navindra Boodia, F 07 (Borlaug Scholar, Mauritius).
Dr. Patricia Guevara, F07 (Universidad Autonoma de Mexico, UNAM)
Dr. Zory Quinde, S07 (Universidad Nacional Agraria, Lima, Peru)
Dariana Rodriguez, F07 (Tecnologico de Monterrey, Mexico)
Benito Gines Martinez, F07-present (Universidad de Cartagena, Spain)
Dr. Basilio Heredia, Summer 08 (CIAD, Culiacan, Mexico)
Rosaria Cornacchia, S08, Summer 08 (University of Foggia, Italy)
Benito Gines Martinez, F07-F08 (Universidad de Cartagena, Spain)
Dr. Ginacarlo Colleli, Summer 08 (June 18-20) (University of Foggia, Italy)
Dr. Francisco Artes Hernandez, Summer 08 (June 17-20) (University of Cartagena, Spain)
Dr. Silvia Rodriguez, F08 (University Santiago del Estero, Argentina)
Natalia Naranjo, January-April, 08 (University of Zamorano, Honduras)
Dr. Juana Aranda, January, 08. (Universidad Autonoma de Nuevo Leon, Mexico)
Dr. Mauricio Gonzalez, Summer 09 (IVIA, Santiago, Chile)
Leon Goity, December 09 (Universidad de Chile, Santiago, Chile)
Two students of Dr. Basilio Heredia, May 09 (CIAD, Culiacan, Mexico)
Dr. Kissinger Maalekuu, F 09 (Research Institution in Ghana)
Dr. Leandro Camargo, Spring 2010 (Brazil)
Cristina Clavijo, Summer 2010 (Spain)
Dr. Leandro Camargo, Spring 2011-Spring 2012 (Brazil)
Leon Goity, PhD student. Fall 2011-Spring 2012 (Chile)
Carla Alegría, Ph.D. student. Spring 2011-summer 2011 (Portugal)
David Dufoo, MSc, student, Spring 2011 (Mexico)
Dr. Daniel Jacobo-Velazquez, summer 2011 (Mexico)
Dr. Ricardo Elesbao, EMBRAPA, Fall 2011 (Brazil)-present

**Undergraduate student workers**
Elizabeth Pappenfort, S07, F07, (FST)
Paula Simons, S09, F09 (FST)
Laura Zimmerer, S09, F09 (FST)
Peter Deleeuw, F09 (Medical Sciences)

**Contracts and grants awarded 2007-2012**
$15,000 Texas Food and Fiber Commission, 2007. Bioassay-directed extraction and characterization of isoprenoids from peanuts and cottonseeds. Co-PI: Cisneros-Zevallos (Funded proposal: $ 30,000)
$30,000  **USDA-CSREES-VIC, 2007.** Abiotic stress to enhance phytochemicals (Co-PI, Funded proposal: $1’500,000)  

$15,000  **Texas Food and Fiber Commission, 2008.** Bioassay-directed extraction and characterization of isoprenoids from peanuts and cottonseeds (Co-PI with Dr. Mo, TWU, total funds $30,000).  

$17,000  **USDA-CSREES-VIC, 2008.** Abiotic stress to enhance phytochemicals (Co-PI, Funded proposal: $1’500,000)  

$10,000  **MARLC, TAMU, 2008.** Anticancer properties of stone fruit extracts against colon and prostate cancer cells in vitro.  

$320,000  **USDA-NRI, 2008.** Nano-Aerosolization as a novel decontamination method for fresh fruits and vegetables.  

$38,000  **CTFA, 2008.** Screening stone fruits for LDL oxidation inhibition (Co-PI with Dr. Byrne, total funds $42,000)  

$15,000  **Texas Food and Fiber Commission, 2009.** Isoprenoids from peanuts and cottonseeds against metastasis (Co-PI with Dr. Mo, TWU, total funds $30,000).  

$18,000  **USDA-CSREES-VIC, 2009.** Abiotic stress to enhance phytochemicals (Co-PI, Funded proposal: $1’500,000)  

$49,700  **California Tree Fruit Agreement, CTFA, 2009.** Screening stone fruits for adipogenesis inhibition (Co-PI with Dr. Byrne)  

$12,000  **Conacyt-Tamu, 2009.** Mexican native fruits and cardiovascular disease (Co-PI with Dr. Carmen Hernandez, total funds $25,000)  

$15,000  **Texas Food and Fiber Commission, 2010.** Isoprenoids from peanuts and cottonseeds against metastasis (Co-PI with Dr. Mo, TWU, total funds $30,000).  

$18,000  **USDA-CSREES-VIC, 2010.** Abiotic stress to enhance phytochemicals (Co-PI, Funded proposal: $1’500,000)  

$49,700  **California Tree Fruit Agreement, CTFA, 2010.** Screening stone fruits for adipogenesis inhibition  

$89,000  **Texas Department of Agriculture, Specialty Crops Program, 2010.** Health properties of stone fruits and pecans  

$5,000  **MARLC, TAMU, 2010.** Health properties of stone fruits  

$106,059  **USDA grant Food Safety, 2010 (Co-PI, Funded proposal: $1’000,000, PI: Elsa Murano)**  

$125,000  **USDA grant Food Safety, 2010 (Co-PI, Funded proposal: $500,000, PI: Matthew Taylor)**  

$20,000  **Bean growers/NIH proposal, 2011.** Bean polyphenols against metabolic syndrome  

$50,000  **California Tree Fruit Agreement, CTFA/growers, 2011.** Screening stone fruits for inhibition of type 2 diabetes  

$14,000  **Peruvian SuperFoods, LLC 2011.** Development of a super juice high in antioxidants  

$65,000  **TDA-USDA-Specialty crops program 2012, Health promoting properties of pecans and stone fruits.**  

$17,000  **Peruvian SuperFoods, LLC 2012.** Development of a super juice high in antioxidants  

**$1,113,459**  Total grants and contracts (managed directly by Cisneros-Zevallos)  

**Additional grants in collaboration with L. Lombardini (more than >75% goes to my group):**  

$15,000 Investigating the nutritional properties of pecans. Salopek Foundation. (co-PI: L. Cisneros-Zevallos)  

$15,000 Investigating the nutritional properties of pecans. Texas Pecan Growers Assn. (co-PI: L. Cisneros-Zevallos)  

$15,000 Investigating the nutritional properties of pecans. Texas Pecan Board. (co-PI: L. Cisneros-Zevallos)  

$21,000 Identification, isolation, and quantification of hydrolysable and non-hydrolysable tannins present in different pecan cultivars. USDA – ‘Designing food for health’. (co-PI: L. Cisneros-Zevallos)  

$24,000 Characterization of the human low-density lipoprotein (LDL) oxidation inhibition and antiplatelet aggregation properties of hydrolysable and non-hydrolysable tannins present in kernels and shells of different pecan varieties. USDA – ‘Designing food for health’. (co-PI: L. Cisneros-Zevallos)  

$25,000 Anti-inflammatory effects of pecan extracts and fractions of different pecan cultivars. L. Lombardini. USDA – ‘Designing food for health’. (co-PI: L. Cisneros-Zevallos)
$167,656 Systems approach at improving the long-term competitiveness of U.S. pecans based on their nutritional and health-promoting components. USDA-NIFA. 2011. Specialty Crop Research Initiative. (co-Pis: L. Cisneros-Zevallos, Monte Nesbitt)

$ 282,656 Total grants (managed in coordination with L. Lombardini)

**Review panels for grants and journals**

**Grant review panel service 2007-2012**

None.

**Editorial boards on which you served 2007-2012**

None

**Journals for which you reviewed papers 2007-2012**

- Journal of Food Science
- Food Chemistry
- Journal of Agricultural and Food Chemistry
- Journal of the Science of Food and Agriculture
- Post-harvest Biology and Technology
- Journal of Food Processing and Preservation
- Food Hydrocolloids
- Bioresource Technology
- Hort Science

**Internal university / agency service on committees 2007 – 2012**

Member of the Food Science Graduate Group Executive Committee 2001-2011.

Invited Member of the Search Committee for two Faculty position in Microbiology in the Department of Poultry Sciences (Contact Person: Alejandro Castillo) (2006-2007)

Participation on the Food Science and Technology IDP academic program review process, to consolidate the Food Science Graduate program into the Food Science Department (contact person: David Reed) 2009-2010.

Member of the Budget Committee from the Horticultural Sciences Department, 2010. (contact person: Tim Davis)

Member of the Graduate Program Committee from the Horticultural Sciences Department, 2011-2012 (contact person: David Byrne).

Mentoring Borlaug Fellow Navindra Boodia from Mauritius sponsored by USAID through The International Office at Texas A&M, Fall 2007 and Dr Kissing Maalekuu from Africa, Fall 2009(Dr. Michael McWhorter).

Manage The FIPSE exchange student Program at Texas A&M in partnership with the U of California (Davis), U of Florida (Gainesville), U of Cordoba (Spain), U of Thessaly (Volos) and the U of Foggia (Foggia) to receive and send students from and to Greece, Spain and Italy.

Extension services: Lecturer for the Better Process Control School (Sponsor: Dr. Al Wagner, Hort-Extension).

**Professional association leadership roles 2007-2012**

Member of the Executive committee of the Fruit and Vegetable Division of the Institute of Food Technologists (IFT), 2001-2012.

Editor of the newsletter for the Fruit and Vegetable division of the IFT, 2003-2012. Published Newsletter each semester

Member of the Institute of Food Technologists (IFT)

Member of the American Chemical Society (ACS)

Member of the American Society for Horticultural Science (ASHS)

Member of the International Society for Horticultural Science (ISHS)
Awards and recognitions
Adjunct Professor at the Tecnologico de Monterrey, Nuevo Leon, Mexico

Fulbright Scholar, August 2011 – To give seminars in Universities of Santiago del Estero, Santa Fe and La Plata in Argentina.

Sabbatical, January-June, 2012. At the Universidad Politecnica de Cartagena, Spain.

Invited speaker (over 45 presentations from 2007-2013)

Italy, March 10-18, 2007. Travel to Bari, Italy as part of the activities of the FIPSE program. Gave seminars (Sponsor: Dr. Giancarlo Colleli).

Monterrey, Mexico May 15-19, 2007. Invited speaker in the internacional conference in Natural Products. Sponsored by the University Autonoma de Nuevo Leon.

Spain, Italy, May 26-June 9, 2007. Invited speaker in the international short course on post-harvest technology of fresh produce and invited speaker in the Iberoamerican conference of Post-harvest technology (Sponsor: University of Cartagena, Dr. Paco Artes). Invited speaker at the University of Foggia, as part of the activities of the FIPSE program (June 2-9, Sponsor: Dr. Giancarlo Colleli).

Dallas, Texas. October 5, 2007. Invited speaker on “new approaches on bioactive compound discovery” (Sponsor: MaryKay Co, Mr. David Gan)

Puerto Vallarta, Mexico, November 8-10, 2007. Invited speaker in the international conference in food microbiology (Sponsor: University of Guadalajara, Dr. Alejandro Castillo)


Mauritius Island, November 13-23, 2008. Trip sponsored the International Office at Texas A&M (Contact: Dr. Mike McWhorter) through a USAID exchange Borlaug Scholar Program. Gave two seminars in the University of Mauritius related to nutraceuticals and high value crops (Contact: Navindra Boodia).

Spain, March 6-16, FIPSE program, 2008. Travel to Cordoba, Spain as part of the activities of the FIPSE program. Gave two seminars in the international fresh-cut course sponsored by the University of Cordoba (contact: Dr. Maria Teresa Sanchez).

Monterrey, Mexico February 28-March 1, 2008. Invited speaker in the internacional conference in Food Processing, Sponsored by the Tecnologico de Monterrey (contact: Dr. Carmen Hernandez-Brenes).

Spain, April 23-May 1, 2008. Trip to Valencia, Spain (April 23-27), as invited speaker to give a seminar in abiotic stresses on fresh produce (sponsor: Instituto Investigacion de Valencia, contact person: Bernar Perez Gago) and trip to Cartagena, Spain (April 27-May 1) as invited speaker in the international course on Post-harvest technology (Sponsor: University of Cartagena, Dr. Paco Artes).

Philadelphia, Pennsylvania, August 18-20, 2008. Invited speaker in annual meeting of the American Chemical Society (ACS), (Contact person: Dr. Bhimu Patil, VFIC)

Mar del Plata, Argentina, December 1-7, 2008. Invited speaker to the internal conference in potato research. Gave a seminar on nutraceuticals from potato tubers (Contact: Dr. Marcelo Huerta, INTA)

Spain, March 31-April 3, 2009. Invited speaker in a short course in Postharvest Technology sponsored by the Universidad Politecnica de Cartagena (contact person: Dr. Francisco Artes).

Anthalya, Turkey, April 7-12, 2009. Speaker at the plenary international meeting in Postharvest Biology and Technology sponsored by the IAHS.
Las Vegas, April 21-22, 2009. Invited speaker to give a seminar on nano-technology applied to post-harvest sponsored by United Fresh (Contact person: Dr. David Gombas).

Almeria, Spain, Sept 5-12, 2009. Invited speaker to give a lecture on fresh-cut produce physiology and nutrients in the International short course on post-harvest technology of fresh-cut produce sponsored by the University of Cordoba (contact person: Maria Teresa Sanchez).

Valencia, Spain, Oct 14-18, 2009. Invited speaker to give a seminar on fresh-cut produce physiology and nutrients organized by Verdifresh (Contact person: Victoria Gilabert).


Spain, March 26-April 2, 2010. Invited speaker at the short course in Postharvest Technology sponsored by the Universidad Politecnica de Cartagena (contact person: Dr. Francisco Artes).


Manado, Indonesia and Singapore, September 9-20, 2011. Invited by the Borlaug Institute to review collaborative efforts in Indonesia and invited speaker in the annual international Food Science conference (Contact person: Dr. Ed Price).

Spain, April 11-April 17, 2011. Invited speaker in a short course in Postharvest Technology sponsored by the Universidad Politecnica de Cartagena (contact person: Dr. Francisco Artes).

Queretaro, Mexico, January 24-30, 2011. Invited speaker to give two seminars in the Universidad Autonoma de Queretaro (Contact person: Dr. Edmundo Mercado).

Turku, Finland, April 25-May 1, 2011. Invited speaker at the University of Turku and to participate as committee member in the Doctorate Dissertation Defense of Ms Ritva Repo.

Argentina, August 11-31, 2011, Invited speaker as a Fulbright Scholar at the University of Santiago del Estero (Santiago del Estero, 3 seminars), University of el Litoral (Santa Fe, 1 seminar) and the University of La Plata (La Plata, 1 seminar).

Puerto Vallarta, Mexico, Nov 3-5, 2011. Invited speaker at the National Congress of Microbiology, sponsored by the University of Guadalajara (Contact person: Dr. Elisa Cabrera).

Indonesia, October, 2012. Invited by the Borlaug Institute to review collaborative efforts in Indonesia and invited speaker in the annual international Food Science conference (Contact person: Dr. Tim Davis).

Spain and Germany, February, 2012. Participated as invited speaker at a short course in Postharvest Technology in Cordoba sponsored by the Universidad de Cordoba (Contact person: Dr. Maria Teresa Sanchez) and as invited speaker in the international fresh-cut produce short course in Berlin sponsored by the University of Foggia (Contact person: Dr Giancarlo Colleli).

Peru, February, 2012. Seminar at the International Potato Center (CIP), Lima, on Andean root and tuber crops (Contact person: Ivan Manrique).

Fresno, California, March, 2012. Invited speaker at the Fresno Food Expo sponsored by the California Tree Fruit League and stone fruit growers (Contact person Denver Shultz).

Spain, March, 2012. Invited speaker in the short course in Postharvest Technology sponsored by the Universidad Politecnica de Cartagena (contact person: Dr. Francisco Artes).
Quito, Ecuador, March, 2012. Invited speaker at the Universidad Central de Ecuador and the Grunenthal pharmaceutical Co. Trip sponsored by Grunenthal pharmaceutical Co

Philadelphia, Sept, 2012. Speaker at the annual meeting of the ACS (Contact person: Dr Navindra Seeram).
Boston, Sept, 2012. Invited speaker at the Science & Standards Symposium on Ingredients for Functional Foods and Dietary Supplements sponsored by the Food Standards US Pharmacopeia (contact person: Dr. Markus Lipp)

Argentina, November, 2012. Invited speaker at the Iberoamerican postharvest conference in La Plata (contact person: Dr. Alicia Chavez).

Aracaju, Brazil, October, 2012. Invited speaker in the international conference on nutraceuticals and tropical fruits (contact person: Dr. Ricardo Elesbao Alves)

Spain, March, 2013. Invited speaker in the short course in Postharvest Technology sponsored by the Universidad Politecnica de Cartagena (contact person: Dr. Francisco Artes).
Brazil, February, 2013. Invited speaker at EMBRAPA (San Carlos and Fortaleza) and at the University of Sao Paulo at Piracicaba and Botucatu (contact person: Dr Ricardo Elesbao).

Bari, Italy, June, 2013 Speaker at the international postharvest meeting in Controlled and modified atmospheres (contact person: Dr. Giancarlo Colleli).

Indonesia, October, 2013. To participate by the Borlaug Institute to review collaborative efforts in Indonesia and invited speaker in the annual international Food Science conference (Contact person: Dr. Tim Davis).
Antalya, Turkey, October, 2013. To participate as invited speaker in the international fresh-cut produce short course sponsored by the University of Foggia (contact person: Dr Giancarlo Colleli).
Kevin M. Crosby  
Associate Professor of Vegetable Genetics and Breeding  
k-crosby@tamu.edu

**Program Summary**

Dr. Crosby has a split appointment of 70% research and 30% teaching within the Department of Horticultural Sciences. His teaching efforts include undergraduate courses in plant breeding and vegetable production. He also currently serves as Co-Chair of a PhD student committee and as a member of four graduate student committees in two departments. He also serves as the undergraduate advisor for the Howdy Farm, student organic agriculture organization. His research program focuses on genetics and breeding of vegetable crops for adaptation to Texas production environments. Peppers, tomatoes, melons and onions are the crops which he has worked on over the past 14 years. Research into disease resistance and enhanced nutritional quality has led to development of many novel breeding lines and eight cultivar releases. His project also investigates root physiology as it relates to stress tolerance and exploitation of interspecific hybridization in pepper for novel trait discovery. Additionally, Dr. Crosby’s lab has developed a molecular marker based linkage map of melons with several useful, PCR-based markers linked to major genes. Genetic transformation of melon to enhance nutritional content and stress tolerance is another component of his project. He has strong collaborations both internationally and nationally with melon, pepper and tomato breeders at other institutions in germplasm maintenance and characterization. He is active in the American Society of Horticultural Sciences at both the national and regional levels and has presented more than 20 posters or talks over the past five years. He also serves as an ad hoc reviewer for more than a dozen scientific journals and three USDA research funding programs.

**Academic Background**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>1999</td>
<td>Texas A&amp;M University</td>
<td>Plant Breeding</td>
</tr>
<tr>
<td>M.S.</td>
<td>1993</td>
<td>University of Hawaii, Manoa</td>
<td>Horticulture (Genetics)</td>
</tr>
<tr>
<td>B.S.</td>
<td>1991</td>
<td>Texas A&amp;M University</td>
<td>Horticulture (Magna Cum Laude)</td>
</tr>
</tbody>
</table>

**Professional Experience:**

- 2008-present Associate professor, Dept. of Horticultural Sciences, Texas A&M University, (70% research, 30% teaching)
- 2006-2008 Associate professor, Texas AgriLife Research Weslaco, Dept. of Horticultural Sciences, Texas A&M University (100% research)
- 1999-2005 Assistant professor, Texas AgriLife Research Weslaco, Dept. of Horticultural Sciences, Texas A&M University (100% research)

**Publications 2007-2012**

**Refereed Publications (underlined names indicate graduate students in the faculty members lab)**


### Editor reviewed publications or conference proceedings 2007-2012


### Popular press articles 2007-2012

Whitefly, tomato growers find truce in new Texas variety. AgriLife Today, Dec 5, 2011.

### Electronic media/software (websites, software, videos, etc.) 2007-2012

none

### Books or chapters in books 2007-1012


**Patents / plant variety releases / plant variety patents**
‘Caro-Tex 313’ hybrid, Habanero pepper- 2012
‘Ben Villalon’ mild, green chile- 2010
‘Chujuc’ western shipper melon- 2008
‘TAM Dulcito’ sweet jalapeño- 2007
License of 3 Habanero and 4 serrano parent lines to Lark Seeds- 2012

**Classes taught (2007-2012)**

**Undergraduate courses**
HORT 325- Vegetable Production: Fall 2012
HORT 404- Plant Breeding: Spring 2010, 2012

**Graduate courses**
Horticulture 691, Research, each semester from Spring 2007 through Fall 2012 at Texas A&M University.

**Graduate students (2007-2012)**
**Advised/co-advised**
Sat Pal Sharma, Ph.D., Horticulture, 2013. Exploitation of Genotype X Environment interaction for improving quality in Melon (Cucumis melo L.)
Yan Ren, Ph.D., Horticulture, 2011. Genetic transformation of honeydew melon with a watermelon PSY gene to enhance carotenoid content.
Justin Butcher, Ph.D., Plant Breeding, 2011. Traditional breeding strategies to increase vitamin C and flavonoids in pepper (*Capsicum spp.*).

**First job taken by each of your graduate students 2007-2012**
Ali Annon- faculty, Dept. of Agronomy, University of Baghdad, Iraq
Yan Ren- plant lighting research at Philips Electronics, Shanghai, China.
Justin Butcher- pepper and cucurbits breeder at Emerald Seeds, El Centro, CA.

**Graduate student committees (non-advisees)**
Jake Uckert, M.S., Horticulture. Investigation of ploidy level and re-bloom trait in roses.
Wayne Tulle, M.S., Horticulture.
Haejeen Bai, Ph.D., Horticulture, 2011. Pre and post-harvest factors affecting phytochemical contents in peppers (*Capsicum spp.*).

**Interdisciplinary program participation (2007-2012)**
one

**Grants and contracts awarded 2007-2012**
11,000 New Mexico Chile Commission, principal investigator. Development of high-yielding, disease-resistant chile varieties for New Mexico. K. Crosby PI, 2012


10,000 New Mexico Chile Commission, principal investigator. Development of high-yielding, disease-resistant chile varieties for New Mexico. K. Crosby PI, 2011

12,000 Pickle Packers Inc. Improving Quality and disease resistance in pickling peppers. K. Crosby PI, 2011-2013

6,000 New Mexico Chile Commission, principal investigator. Development of high-yielding, disease-resistant chile varieties for New Mexico. K. Crosby PI, 2010.

44,000 USDA-NIFA,CSREES- Designing foods for Health, (total of $1,288,975) Expression of PSY and Or genes in transgenic melon lines to increase beta-carotene. Test candidate RAPD markers using PCR on our family with elevated levels of flavonoids and ascorbic acid to verify significant linkages. Bhimu Patil PI, K. Crosby co-PI, 2010.

10,000 New Mexico Chile Commission, principal investigator. Development of high-yielding, disease-resistant chile varieties for New Mexico. K. Crosby PI, 2009.

50,000 USDA-NIFA,CSREES- Designing foods for Health (total of $1,291,218). Molecular marker development and phenotypic selection for increased flavonoid and carotenoid levels in TAES pepper breeding lines; Optimizing genetic transformation of advanced melon lines to increase beta-carotene. Bhimu Patil PI, K. Crosby co-PI, 2009.

15,000 New Mexico Chile Commission, principal investigator. Development of high-yielding, disease-resistant chile varieties for New Mexico. K. Crosby PI, 2008.

46,904 USDA-NIFA,CSREES- Designing foods for Health (total of $1,002,500). Molecular marker development and phenotypic selection for increased flavonoid and carotenoid levels in TAES pepper breeding lines; Development of melon cultivars for Texas, with genetically enhanced levels of beta-carotene, ascorbic acid and sugars. Bhimu Patil PI, K. Crosby co-PI, 2008.

18,000 New Mexico Chile Commission, principal investigator. Development of high-yielding, disease-resistant chile varieties for New Mexico. K. Crosby PI, 2007.

83,544 USDA-CSREES, Developing foods for Health (total of $1,800,500). Molecular marker development and phenotypic selection for increased flavonoid and carotenoid levels in TAES pepper breeding lines. Development of melon cultivars for Texas, with genetically enhanced levels of beta-carotene, ascorbic acid and sugars. Leonard Pike, PI, K. Crosby co-PI. 2007.

17,000 Texas-Israel Exchange/BARD (total of 50,000). Grafting as a strategy for disease and stress management in muskmelon production. K. Crosby, PI, co-PI’s: John Jifon and Dan Leskovar. 2007 (year 4)


Review panels for grants and journals
Grant review panel service 2007-2012
USDA-SBIR – 2012
Florida Citrus Board- 2012
USDA Plant Genome- June 2009
USDA-Crop Germplasm Proposal Cucurbits Review- 2009-2010
USDA-AFRI- Integrated Research Program Plant Breeding- 2009

Editorial boards on which you served 2007-2012
Cucurbit Genetics Cooperative 2007-present

Journals for which you reviewed papers 2007-2012
J. American Society for Horticultural Sciences
HortScience
Crop Science
BMC Genomics
Molecular Breeding
Plant Disease
Euphytica
Journal of Horticultural Science and Biotechnology
Scientia Horticulturae
Theoretical and Applied Genetics
Tree Genetics and Genomes
International Journal of Vegetable Science

**Internal university / agency service on committees 2007 – 2012**
Plant Release Committee- 2007-present
Departmental Budget Committee- 2010
Scientific Advisory Committee for VFIC 2008-present

**Professional association leadership roles 2007-2012**
ASHS Vegetable Breeding Working Group: Secretary, Chair-elect and Chair- 2007-2009
Organized and Convened two Texas Pepper Conferences (2007, 2009)

**Awards and recognitions 2007-2012**
none
Fred T. Davies, PhD, CPH
Regents Professor, Texas AgriLife Research Faculty Fellow
Dept Horticultural Sciences, Interdisciplinary program of Molecular & Environ. Plant Sciences
f-davies@tamu.edu

Program Summary
Dr. Fred Davies has a 50% teaching, 50% research appointment. Teaching responsibilities currently include Hort 326 – Plant Propagation, and Hort 431 – Nursery Production & Management. For 23 years through 2010, he chaired the Dept of Horticultural Sciences Graduate Seminar Program, which entailed organizing, inviting and hosting invited outside speakers. He is the co-author of the 8th edition of Hartman and Kester's Plant Propagation-Principles and Practices (2011), which is the standard text used internationally.

Davies research has been multi-dimensional, multi-disciplined – and well-balanced, with as much effort put into teaching and service – as supported by national and international recognition and awards. His research has been supported by NASA, USDA, NSF, Guggenheim Foundation, Fulbright, other foundations and industry. Davies research includes: plant responses to environmental and biotic stress; NASA— low atmospheric pressure (hypobaric), controlled environment crop systems; physiology of mycorrhizal enhancement of plant drought and nutrient stress resistance, biofertilizers, ornamental horticulture production (nursery and greenhouse crops), plant propagation systems, alternative nursery production systems, low input agriculture sustainable systems utilizing mycorrhizal fungi, tissue culture propagation systems, and the interaction of plant stress and IPM systems.

He is the only faculty member in Horticulture at TAMU to be recognized as both a Regents Professor (2010) and AgriLife Research Faculty Fellow (2007) – which is testament of national peer recognition of a productive and balanced teaching, research and service program – the three pillars of the land-grant system. For the past 6-plus years, he has been involved with the leadership of the American Society for Horticultural Sciences (ASHS), serving as International Vice-President, President, and Chair of the Board of Directors. During this same period, he chaired a national committee of industry and academics to develop the ASHS-Certified Horticulturist program - which has meant communicating to the public, press and industry the importance and needs of professionalizing horticulture. Davies has a long-term track record of leadership with industry groups, such as the International Plant Propagators Society.

His research and teaching direction is currently focused on international horticulture. He was awarded a 3rd CIES – Senior Fulbright Scholar Fellowship (2012-13) to Indonesia, and is involved in a USAID funded programs with Indonesia, and a USDA-FAS-SCRP program with Ghana and Nigeria. He is currently a finalist (2013) for a Jefferson Science Fellowship to the U.S. Dept of State/USAID.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>1978</td>
<td>University of Florida</td>
<td>Horticulture; Plant Physiology; Tropical Agriculture.</td>
</tr>
<tr>
<td>M.S.</td>
<td>1975</td>
<td>Rutgers University</td>
<td>Horticulture; Plant Physiology</td>
</tr>
<tr>
<td>B.S.</td>
<td>1971</td>
<td>Rutgers College</td>
<td>History; minor-Biological Sciences</td>
</tr>
</tbody>
</table>

Professional Experience:

2012-2013 Fulbright Senior Fellow: Visiting Professor, IPB – Bogor Agricultural Univ., Bogor, Indonesia
2010-present Regents Professor, TAMU. (50% teaching, 50% research)
2007-present Texas AgriLife Research Faculty Fellow, TAMU.
    Fulbright Senior Fellow, J.S. Guggenheim Fellow: Visiting Professor, National Agrarian University LaMolina (UNALM), Lima, Peru; Visiting Scientist, Intl Potato Institute (CIP), Lima, Peru.
1993-1994 Fulbright Senior Fellow: Visiting Professor, Monterrey Tech University (ITESM) Queretaro, Mexico; Visiting Scientist, CINVESTAV Plant Biology Institute, Irapuato, Mexico.
1990-present Professor Horticultural Sciences & Molecular and Environmental Plant Sciences, TAMU.
1987 Visiting Scientist, USDA Horticultural Crops Research Laboratory, Corvallis, Oregon.
1987 Visiting Associate Professor, Dept. Horticultural Sciences, Oregon State Univ., Corvalis, OR. Assoc. Professor Nursery Crop Physiology, Department of Horticultural Sciences, TAMU, College Station, TX.
1978-1983 Assistant Professor, Department of Horticultural Sciences, TAMU, College Station, TX.
Publications 2007-2012

Refereed Publications


Editor reviewed publications or conference proceedings 2007-2012

Spiers, J.D., F.T. Davies, Jr., C. He, S. Finlayson, K.Heinz, A. Chau and T. W. Starman. 2007. Fertilization Affects the Susceptability of Gerbera jamesonii to Western Flower Thrips (WFT [Frankliniella occidentalis (Pergande)]—Impact on Plant Growth and Quality SNA Research Conference Proceedings. 52:.


Popular press articles 2007-2012


One might be put off from becoming an astronaut looking at the array of freeze-dried ‘delights’ astronauts have to get by on for sustenance. Jon Stewart reports from Texas A&M University where scientists are looking into growing food crops up in space. Perhaps surprisingly, scientists growing lettuce under low pressure conditions have found that the plants would grow better than they do on earth!

http://aggie-horticulture.tamu.edu/faculty/davies/index.html

**Electronic media/software (websites, software, videos, etc.) 2007-2012**

Research Webpage: http://aggie-horticulture.tamu.edu/faculty/davies/ResearchHomepg.html

Faculty Webpage: http://aggie-horticulture.tamu.edu/faculty/davies/index.html

NASA Low-Pressure Research Webpage: http://aggie-horticulture.tamu.edu/faculty/davies/research/nasa.html

Nursery Crop Physiology/Mycorrhizal Research Webpage: http://aggie-horticulture.tamu.edu/faculty/davies/faculty/davies/index.html


**Books or chapters in books 2007-2012**


(Book Chapter)


**Patents / plant variety releases / plant variety patents**
None

**Classes taught (2007-2012) Undergraduate courses**
Hort 326: Plant Propagation
Hort 431: Nursery Production & Management
Annually incorporate undergraduate students in research program as student workers and laboratory assistants, frequently with independent research projects – including teaching Hort 485: Independent Studies and Hort 489: Directed Research.
Annually guest lecture in Hort 101: Introductory Horticulture.

**Graduate courses**
Chair, Horticultural Sciences Graduate Seminar Program, TAMU (for 23 years through May 2010).

**Graduate students (2007-2012) Advised**


Have served as the major advisor to 13 PhD and 12 Masters graduate students, who are professors and leaders in horticulture.

**First job taken by each of your graduate students 2007-2012**
James D. Spiers – Assistant Professor, Auburn University

**Graduate student committees (non-advisees)**


**Interdisciplinary program participation (2007-2012)**
Molecular & Environmental Plant Sciences (MEPS) – have served on various committees including the executive committee.

**Grants and contracts awarded 2007-2012**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>128,089</td>
<td>NASA-Johnson Space Center NAJ04HF53G. Plant Growth at Sub-Ambient Atmospheric Pressures with Control of the Partial Pressures of Constituent Gases”. PI with R. Lacey, C-J He (2007; final year of $432,893 grant)</td>
</tr>
<tr>
<td>123,511</td>
<td>NASA-Johnson Space Center NAJ04HF53G. Plant Growth at Sub-Ambient Atmospheric Pressures with Control of the Partial Pressures of Constituent Gases” (2008) PI with R. Lacey, C-J He.</td>
</tr>
<tr>
<td>100,000</td>
<td>NASA-Johnson Space Center NAJ04HF53G. Plant Growth at Sub-Ambient Atmospheric Pressures with Control of the Partial Pressures of Constituent Gases” (2009) PI with R. Lacey, C-J He (Co-PIs).</td>
</tr>
</tbody>
</table>
$25,000 NASA-Johnson Space Center NAJ04HF53G. Augmentation of NNJ04HF31G: Plant Growth at Sub-Ambient Atmospheric Pressures with Control of the Partial Pressures of Constituent Gases. PI with R. Lacey, C-J He (Co-PIs). (2011).


$25,000 CIES – Senior Fulbright Scholar Program (Indonesia): “Enhancing Conservation, Propagation and Use of Underutilized Indonesian Tropical Plants”. (2012-13).

$30,500 TAMU Support (Dean of Faculties; COALS; Borlaug Institute for International Agriculture) of Senior Fulbright Program. (2012-13)

$679,100 TOTAL GRANTS

Review panels for grants and journals, Grant review panel service 2007-2012
None.

Other Review Panels
Reviewer of Industrial Research Chair in the field of Controlled Environments and Life Support. School of Environmental Sciences, University of Guelph, Guelph, Ontario, Canada. (2010)

Editorial boards on which you served 2007-2012
International Plant Propagators’ Society; currently serve as Editor of the IPPS-SRNA (1993-present).

Journals for which you reviewed papers 2007-2012
HortScience
HortTechnology
International Journal of Phytoremediation
Plant Soil
Photosynthetica
Physiologia Plantarum

Internal university / agency service on committees 2007 – 2012
TAMU, Faculty Development Leave Committee – COALS representative MEPS Exec Committee.
TAMU, MEPS Award Committee, chair, 2007-9
TAMU Horticulture Graduate Program Committee.
TAMU, Appointed by the Deputy Chancellor of Agriculture to Texas Agriculture, TAMU, COALS - New Resources Strategies Task Force Committee (2011)
University Library Representative, 1987-present

Professional association leadership roles 2007-2012
ASHS – Fellows Screening Committee (2005-2012)
ASHS- President (2010-11), ASHS – Board of Directors (2009-2012)
ASHS-CH Workshop – Feb 2011. Developed a Study Workshop for ASHS-CH Exam with George Fitzpatrick, Mary Lamberts and Bill Lemont at ASHS-SR meetings in Corpus Christi, Texas.
Chair, ASHS-Certified Horticulturist program (2005-present). Led the development of a national program to develop professional certification in Horticulture. The goal of the Certified Horticulturist program is to validate the knowledge and skills of working horticultural practitioners in the industry of horticulture. While initially targeting the industry practitioner, self-sustaining certification programs also have great opportunities in assessment of university and community colleges teaching horticulture, and in attracting and serving non-land-grant horticulturists. As Chair, developed the business plan to get ASHS to commit $500,000 to fund this national project to professionalize Horticulture. This has been very time-consuming project – developing a national strategic alliance between ASHS and the horticulture industries. The-project entailed ASHS hiring a professional facilitator, developing national surveys for industry input and numerous workshops with national industry participants and subject matter experts. The national examination was completed in fall 2008, and the 1st exam given in 2009. We completed a for-purchase ASHS-CH Study Guide (2010) and are developing Study Workshops for preparing test takers, as well web-based teaching modules and

**International Plant Propagator’s Society (IPPS)**
- Board of Directors Member IPPS-SR. (1990-present)

**Awards and recognitions 2007-2012**
- President, American Society for Horticultural Sci. [ASHS] (2010-11);
- Chairman, ASHS Board of Directors (2011-12).
- Regents Professor, Texas A&M University (2010-present).
- AgriLife Research Faculty Fellow – TAMU (2007-present)
- Fulbright Senior Scholar to Indonesia (2012-2013)
- Awarded Faculty Development Leave, TAMU (2012-13)
- Finalist for Jefferson Science Fellow at US Dept of State/ USAID (2013)

**Plenary Speaker**
- Indonesia (2012): Funded, keynote presentations. A) 4th International Conference on Biosciences and Biotechnology, Udayana University, Bali (2012); B) Indonesian Institute of Sciences (LIPI), Cibinong (2012); C) Conference on Food Sovereignty and Natural Resource Management in Archipelago Regions – Student Union of Moluccas or the Spice Islands (PERMAMA), Bogor (2012); D) Indonesian National Horticulture Meetings (PERHORTI), Surabaya (2012); E) 1st International Plantation Conference, Bogor (2012).

**Membership in Professional and Honorary Societies.**
- American Society of Horticultural Sciences, International Plant Propagators Society,
- Gamma Sigma Delta, Pi Alpha Xi, Sigma Xi, Phi Kappa Phi
- TAMU Fulbright Fellows Association
Tim D. Davis  
Professor of Horticultural Sciences &  
Regional Director for Asia, Borlaug Institute for International Agriculture  
t-davis5@tamu.edu

Program Summary
Dr. Davis’ current primary responsibility is to serve as Regional Director for Asia for the Borlaug Institute of International Agriculture at Texas A&M. This includes developing and implementing a strategy to increase the Institute’s presence in Asia to improve prospects for procuring projects in the region. This includes fostering collaborative international research and education, and making exploratory trips to Asian countries which have potential for collaboration. He also provides technical and leadership expertise to ongoing Borlaug Institute programs which have a horticultural or plant science component. This includes, but is not limited to, programs such as the Global Coffee Quality Research Initiative, Indonesia Tropical Plant Science Project, the Ukulima Farm Experiment Station, and horticultural development programs in Rwanda, Tanzania, and Iraq. This also includes participation in new program opportunities as they arise (e.g. USAID Bangladesh value chain project, Afghanistan AGRED project). Davis represents the Borlaug Institute in the field of horticulture and, when called upon, more broadly with respect to the Institute’s overall mission. He leads and/or participates in the development of appropriate international conferences (e.g. Desert Technologies 11 Conference to be held in San Antonio in November 2013.) In the Department of Horticultural Sciences, he has responsibility for developing Study Abroad courses. He has significant professional service responsibilities and serves as Chair of the Department’s Promotion and Tenure Committee. His research background is in adventitious root formation and plant growth regulation. He was named a Fellow of the American Society for Horticultural Science in 2006.

Academic Background
Ph.D (Horticulture): Oregon State University, Corvallis, 1983.  
B.S. (Horticulture): Brigham Young University, Provo, 1978; Magna Cum Laude.  
Graduated from Sonoma Valley High School, Sonoma, California, 1974.

Professional Experience
Senior Scientist & Regional Director for Asia, Borlaug Institute for International Agriculture, and Professor, Department of Horticultural Sciences, Texas A&M University, College Station, Texas (2011-present)

Professor and Head, Department of Horticultural Sciences, Texas A&M University, College Station, Texas (2003-2011) (100% administrative appointment)

Resident Director, Texas A&M University Research and Extension Center, Dallas, Texas (1996-2005). (100% administrative appointment)

Professor of Environmental Horticulture, Texas A&M University Research and Extension Center, Dallas, Texas (1995-2005).

Interim Associate Resident Director, Texas A&M University Research and Extension Center, Dallas, Texas (September 1995-April 1996).

Associate Professor of Environmental Horticulture-Research Horticulturist, Texas A&M University Research and Extension Center, Dallas, Texas (1989-1995). Project leader for ornamentals & floriculture/plant physiology research, 100% research.

Associate Professor of Horticulture, Department of Agronomy and Horticulture, Brigham Young University, Provo, Utah (1987-1989; continuing status granted 1987). Responsibilities included conducting research and teaching courses related to ornamental horticulture and crop physiology. Approximate split: 50% research, 50% teaching.
Assistant Professor of Horticulture, Department of Agronomy and Horticulture, Brigham Young University, Provo, Utah (1982-1987).

Publications 2007-2012

Abstracts


Trade/Extension/Proceedings Articles


Refereed Journal Articles


Refereed Journals Served as a Reviewer, 2007-2012
HortScience
Plant Cell Tissue and Organ Culture
Journal of Mountain Science
New Zealand Journal of Crop and Horticultural Science
Canadian Journal of Plant Science
Chilean Journal of Agricultural Research
Annals of Applied Biology
African Journal of Agricultural Research

Grants and Contracts (serve as PI), 2007-2012
Tropical Plant Science Curriculum Project, funded by USAID, $636,000 for 3 years (2011-2013)
Afghan Agricultural Research and Extension Development, funded by USAID, $2.2 million for 5 years (2012-2016)

Grant Panels/Reviews, 2007-2012
USDA/CSREES review panel member, 2008-2009
USDA/CSREES review panel chair, 2010
ad hoc reviewer for Consortium for Plant Biotechnology Research, 2008
Georgian National Science Foundation peer reviewer, 2009 and 2012
ad hoc review for BARD, 2010

Invited Presentations, 2007-2012
USAID, Washington, D.C., 2011
National Food Science and Technology Seminar, 2011, Manado, Indonesia
American Society for Horticultural Science annual meeting, 2011 (Hawaii)
International Conference of Food Factors, 2012, Jakarta, Indonesia
Leadership/Service Roles

Chair, Phi Kappa Phi Outstanding Junior Selection Committee, College of Agriculture and Life Sciences, Texas A&M University, 2007

Scientific Committee, ISHS Quality Management in Supply Chain of Ornamentals Symposium, held December 2007 in Bangkok, Thailand

Participated in Executive Coaching Program, Center for Creative Leadership (including 360 By Design analysis), 2007-2008

Member, Executive Committee, Southern Region, American Society for Horticultural Sciences, 2011-present

Section Chair, Alternate and Horticultural Crops, Texas Plant Protection Association 2009 Annual Meeting, Bryan, Texas

Reviewer, Texas A&M Association of Former Students, College-level Teaching Awards, 2009

Member, Review Panel, Texas A&M Regents Professor Award Committee, 2009

Member, Scientific Committee, International Conference on Quality Management in Supply Chains of Ornamentals, held in Thailand, December 2011

Chair, External Department Review Committee, Department of Environmental Horticulture, University of Florida, October 2010

Member Imperative 9 & 12 Study Team, Vision 2020, Texas A&M University, 2011

Member, Feed the Future Committee, College of Agriculture and Life Sciences, Texas A&M University, 2011

Member, Research/Institutional Partnerships Working Group, USINDO Joint Council on Higher Education, 2012

Member, Advisory Board, Buffett Conflict and Development Endowed Chair, Texas A&M University, 2012

Member, ASHS Fellow Screening Committee, 2013

Member, Remote Review Team, School of Agriculture, Shanghai Jiao Tong University, China, 2012

Chair, External Review Team, Department of Horticulture, Iowa State University, 2013

Chair, Department of Horticultural Sciences Promotion and Tenure Committee, 2012-present

Chair, 11th International Conference on Desert Technologies, to be held November 2013, San Antonio, Texas, USA
Steven George  
Professor and Extension Horticulturist  
s-george3@tamu.edu

Program Summary
With a 100% Extension appointment, the primary focus of both my research and Extension efforts is in the field of research-based environmental landscape management. To address the major environmental concerns regarding American landscapes, I first developed the overall Earth-Kind® Environmental Landscape Management System, then I created and serve as the National Coordinator for the Earth-Kind Rose Program. We are conducting two national Extension programs, one on EarthKind Roses (which has now gone international), the other on Earth-Kind Environmental Soil Management. We have recently concluded, what is to my knowledge, the largest single site environmental rose research study of its kind in the nation, supported by randomized, replicated field trials at 70 total sites in Alabama, Illinois, Iowa, Kansas, Kentucky, Louisiana, Nebraska, Texas, and West Virginia. We have cooperators testing Earth-Kind roses in 27 states (Alaska to Florida) and five foreign countries (Bermuda, Canada, India, New Zealand, and Romania). We took our Earth-Kind Rose concept worldwide at the prestigious World Federation of Rose Societies Convention in Vancouver. Earth-Kind Roses have become, to my knowledge, the fastest growing and most popular university program of its kind in the nation. This makes Texas A&M AgriLife Extension a national and international leader in research-based environmental landscape management. Our work has been favorably reported on in The New York Times.com (three times), London Financial Times.com (twice), ABC News.com, MSNBC.com, Martha Stewart Living Radio Network (estimated listening audience: 17 million), Reader’s Digest, Christian Science Monitor, American Nurseryman, Better Homes and Gardens.com, Fine Gardening.com, and Mother Earth News.com. The Associated Press has released a nationwide article devoted exclusively to Earth-Kind Roses. Our National Earth-Kind Rose Research was featured as the cover photograph for HortScience. I collaborate with valued colleagues at eight other universities (Colorado State, Iowa State, Kansas State, LSU, and the Universities of: Illinois, Minnesota, Nebraska, and Wisconsin) on Earth-Kind research matters.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
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<tbody>
<tr>
<td>Ph.D.</td>
<td>1986</td>
<td>North Carolina State University</td>
<td>Plant Pathology</td>
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<tr>
<td>M.S.</td>
<td>1980</td>
<td>Oklahoma State University</td>
<td>Horticulture</td>
</tr>
<tr>
<td>B.S.</td>
<td>1970</td>
<td>Oklahoma State University</td>
<td>Zoology</td>
</tr>
</tbody>
</table>

Professional Experience

2001-present  
Professor and Extension Horticulturist for North Central District  
Texas A&M AgriLife Extension Service, Dallas  
(100% Extension appointment)

1991-2001  
Associate Professor and Extension Horticulturist for North Central District  
Texas Agricultural Extension Service, Dallas

1988-1991  
Extension Horticulturist for North Central District  
Texas Agricultural Extension Service, Dallas

1987-1988  
Assistant Professor and State Extension Plant Pathology Specialist  
Oklahoma Cooperative Extension Service, Stillwater

1986-1987  
State Extension Plant Pathology Specialist  
Arizona Cooperative Extension Service, Phoenix

1979-1982  
County Extension Agent-Horticulture  
Texas Agricultural Extension Service, San Antonio

1977-1979  
County Extension Agent-Horticulture  
Kansas Cooperative Extension Service, Newton

Publications 2007-2012

Refereed Publications 2007-2012


Editor-Reviewed Publications or Conference Proceedings 2007-2012


News Releases 2007-2012

Popular Press Articles 2007-2012

Invited Book Chapters 2007-2012


Extension Publications 2007-2012
George, S., G. Wylie, and D. Welsh. 2010. Earth-Kind Rose brochure published by the Texas Department of Agriculture.
Industry Publications 2007-2012

Manuals 2007-2012

External Grants 2007-2012

Gifts 2007-2012

In-Kind Contributions 2007-2012
$5,000 George, S., D. Harp, D. Zlesak, K. Zuzek, J. Griffin, and G. McDonald. 2012. Support for Phase II (western half) of the Earth-Kind Rose Display Garden in Columbus, Ohio: in-kind gift of labor and materials from the Columbus Recreation and Parks Department. Total: $30,000.


$5,000 George, S., D. Harp, D. Zlesak, K. Zuzek, J. Griffin, and G. McDonald. 2011. Support for Phase II (eastern half) of the Earth-Kind Rose Display Garden in Columbus, Ohio: in-kind gift of labor and materials from the Columbus Recreation and Parks Department. Total: $30,000.


$1,440  Cue, K. and S. George.  2010.  Support for Earth-Kind program: in-kind gift of compost, plants, drip system, and mulch for field trial in Bellevue, Nebraska. Total: $2,880.

$30,888.24  George, S. and D. Welsh.  2010.  Support for Earth-Kind program: in-kind gift of publishing and distribution costs, etc. for the Earth-Kind Rose brochure provided by the Texas Department of Agriculture. Total: $46,337.


$1,040  Wylie, G. and S. George.  2010.  Support for Earth-Kind program: in-kind gift of compost, plants, drip system, and mulch for display bed in Cleburne, Texas. Total: $2,080.

$6,680  George, S.W., G. Church, and K. Schofield.  2009.  Support for Phase II Earth-Kind research: in-kind gift of labor and materials from the Farmers Branch Parks and Recreation Department. Total: $20,040.


$26,667  George, S.W., D. Harp, and D. Zlesak.  2008.  Support for Phase II Earth-Kind research: in-kind gift of labor and materials from the Farmers Branch Parks and Recreation Department. Total: $80,000.


$5,000  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Addison, Texas. Total: $5,000.

$1,920  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Canyon, Texas. Total: $1,920.

$1,200  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Corpus Christi, Texas. Total: $1,200.

$1,200  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Farmers Branch, Texas. Total: $1,200.

$1,200  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Fredericksburg, Texas. Total: $1,200.


$1,200  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Rosenberg, Texas. Total: $1,200.

$9,600  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Tyler, Texas, at Chamblee's Rose Nursery. Total: $9,600.

$1,440  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Victoria, Texas. Total: $1,440.

$1,200  George, S.W. 2007. Support for EarthKind™ program: in-kind gift of compost, plants, irrigation system, and mulch for field trial in Glenwood, Iowa, at the home of Annette O'Brien. Total: $1,200.
$1,200  George, S.W.  2007.  Support for EarthKind™ program:  in-kind gift of compost, plants, irrigation system, and mulch for field trial in Omaha, Nebraska, at Lauritzen Gardens.  Total:  $1,200.

$2,400  George, S.W.  2007.  Support for EarthKind™ program:  in-kind gift of compost, plants, irrigation system, and mulch for field trial in Berkeley Springs, West Virginia, at the home of Kate Lehman.  Total:  $2,400.

$800  George, S.W.  2007.  Support for EarthKind™ program:  in-kind gift of expanded shale for field trial in Kansas City, Kansas.  Total:  $800.

$800  George, S.W.  2007.  Support for EarthKind™ program:  in-kind gift of expanded shale for field trial in Wichita, Kansas.  Total:  $800.


$12,500  Smith, P. and S.W. George.  2007.  Support for EarthKind™ program:  in-kind gift of compost, plants, irrigation system, mulch, and hardscaping for the Ruthan Rogers EarthKind™ rose garden in Farmers Branch, Texas.  Total:  $25,000.

For-Sale Publications 2007-2012


Awards and Recognition 2007-2012

Superior Service Award, Team Category, Texas A&M AgriLife Extension Service, 2012
Recognized at the Great Rosarians of the World Conference in New York City, 2008
Mengmeng Gu
Assistant Professor/Extension Specialist, Ornamental Horticulture
mgu@tamu.edu

Program Summary

Dr. Gu has 100% with Texas A&M AgriLife Extension Service. She provides leadership and work collaboratively with Extension Specialists and County Extension Agents to further develop and implement the Earth-Kind® Environmental Stewardship program. She works collaboratively with green industry professionals, the Texas Nursery and Landscape Association (TNLA), other commodity organizations, and colleagues to develop educational programs for industry professionals. She delivers Extension educational information and presentations in support of county, regional and statewide programs. She provides technical expertise and support to green industry professionals. She also provides leadership for Earth-Kind® Outcome/Output planning and evaluation.

She serves as the chair of two MS student committees, taught Nursery Production and Management once and offers a study abroad opportunity every year for students and agriculture professional to learn horticulture production and marketing in China. Her research program involves sustainable horticulture crop production, marketing and extension, and sustainable landscape practices. In a service capacity, Dr. Gu has been serving on the board of Southern Sustainable Agriculture Working Group and leads the effort on diversity and involving land-grant universities in sustainable agriculture.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
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<tbody>
<tr>
<td>Ph.D.</td>
<td>2006</td>
<td>University of Arkansas</td>
<td>Plant Sciences/Horticulture</td>
</tr>
<tr>
<td>M.S.</td>
<td>2001</td>
<td>Beijing Forestry University</td>
<td>Landscape Horticulture</td>
</tr>
<tr>
<td>B.S.</td>
<td>1998</td>
<td>Beijing Forestry University</td>
<td>Landscape Horticulture</td>
</tr>
</tbody>
</table>

Professional Experience:

2012- present Assistant Professor/ Extension Specialist– Commercial Horticulture, Texas A&M University (100% extension)
2006- 2011 Assistant Extension Professor – Ornamental Horticulture, Mississippi State University (83.4% Extension 16.6% Teaching)

Publications 2007-2012

Referred Publications (underlined names indicate graduate students and postdoc in the faculty members lab)


**Editor reviewed publications or conference proceedings 2007-2012**


**Popular press articles 2007-2012**

Gu, M. 2012. Quarantine—Dealing with the big headache. TNLA June 18-20
Gu, M. 2012. Hare’s tail. Mississippi Gardener 12 March
Gu, M. 2012. Shrimp plant. Mississippi Gardener 12 April
Gu, M. 2012. Plumbago auriculata. Mississippi Gardener 12 May
Gu, M. 2012. Snow Princess® alysum. Mississippi Gardener 12 June
Gu, M. 2012. ‘Sunrise Serenade’ morning glory. Mississippi Gardener 12 July/August
Gu, M. 2012. Mescal bean. Mississippi Gardener 12, September
Gu, M. 2012. Autumn Sage. Mississippi Gardener 12 October

Electronic media/software (websites, software, videos, etc.) 2007-2012
Blog http://greenvision.wordpress.com/
Season extension horticulture in China DVDs. May 10-June 1, 2010.
High tunnel field day DVD. March 11, 2010.

Books or chapters in books 2007-1012

Patents / plant variety releases / plant variety patents

Classes taught (2007-2012)
Undergraduate courses
Horticulture 341 Nursery Production and Management Fall 2012
Horticulture 489, Special Topics in Horticulture----Study abroad in China: Summer 2012

Graduate courses
Graduate students (2007-2012)
Advised/co-advised
Xi Wang. Current MS student.
Yanjun Guo. Current MS student.

Grants and contracts awarded 2007-2012
$10,000. PI. Promote Earth-Kind Program for Sustainable Urban Agriculture Practices. SARE (Gu-$10,000).
$17,000. PI. Unrestricted gift. TNLA.
$4,500 (total $52,964). Co-PI. Urban Landscape Water Conservation through Irrigating Landscapes with Reclaimed Water. RGBI.
$88,905. PI. US-China partnership for strengthening research, education and extension in season extension production and marketing. USDA NIFA ISE transfer.
$28,634. Co-PI. Creating virtual nursery trips to improve on-campus & distance education in nursery production and management. USDA NIFA HEC transfer.
$18,555. PI. Extension programs ($9,355—International horticulture field trip; $9,200—Earth-Kind landscape short course).
$23,000. Co-PI. Investigation of an alternative substrate (potting mix) in greenhouse industry. MSU MAFES SRI. 01/01/2011-12/31/2011 (Gu-$23,000; Reduced to $6,576 due to the nature of appointment).
$12,000 (covering international travel expenses for 15 days for 4 US investigators; ~$3,000/person with a total estimate of $12,000). PI. TEAM = Together Everyone Achieves More-----US-China scientific exchange on low-cost season extension technology for local sustainable specialty crop production and marketing. USDA FAS SECP with PRC. 2011-2012. (Gu’s status was changed to Co-PI due to immigration status).
$10,692. Sole-PI Conducting high tunnel construction workshops in Mississippi. USDA SCBG. 2011.
$307,356. Co-PI. Creating Virtual Nursery Trips to Improve On-Campus and Distance Education in Nursery Production. USDA, National Institute of Food and Agriculture (NIFA) Higher Education Challenge (HEC) Grants Program. 2010-2012 (Gu-$34,255).
$32,000. Co-PI Developing cover crop management systems to optimize sustainability and profitability of specialty crop production in high tunnels. USDA SCBG. 2010-2012.
$13,964. Co-PI. Determine the efficacy of biological fungicides for control of pythium stem and root rot in poinsettia. IR-4 Biopesticide Program. 2010-2011.
$22,530. Sole-PI. Investigation of different high tunnel systems for specialty cut flower production in Mississippi. USDA SCBG. 2009-2012.
$15,000. Investigation of best management practice for specialty cut flower production in Mississippi. PI. USDA SCBG. 2009-2010.
$1,600. School seedling nursery program for Mississippi habitat restoration. Co-PI. William M. White Special Project Award. Mississippi State University. 2008
$50,000. Could rice straw and cottonseed serve as alternatives to perlite and peat moss as greenhouse substrates? Sole PI. MSU MAFES SRI. January 2007- December 2008
$2,950. Improving Teaching of Plant Nutrient in Greenhouse Management Class Using Aeroponics System. Schillig Special Teaching Grant. Sole PI. Mississippi State University. 2007

Review panels for grants and journals
Grant review panel service 2007-2012
Grant Reviewer for USDA AMS
Grant Reviewer for USDA Hort CRSP
Lindbergh Foundation Grants Technical Review Panel

Editorial boards on which you served 2007-2012

Journals for which you reviewed papers 2007-2012
Journal of the American Society for Horticultural Sciences
HortScience
HortTechnology
Plant Breeding
Archives of Environmental Contamination and Toxicology
Acta Physiologiae Plantarum
Global Change Biology

Internal university / agency service on committees 2007 – 2012

Professional association leadership roles 2007-2012
USDA-ARS Woody Landscape Plant Crop Germplasm Committee, 2011-
Board member of Southern Sustainable Agriculture Working Group (SSAWG), 2009-
SSAWG Executive Committee, 2009-
Chair of SSAWG Diversity Committee, 2012-
Chair of SSAWG Strategic Planning Committee, 2010-2011
Chair of SSAWG Funding Development Committee, 2011- 2011
Chair of SSAWG Scientific Committee, 2010-
SNA Section Editor for Weed Control, 2007-2013
American Society for Horticultural Science
Chair of ASHS Outstanding International Horticulturist Award Committee, 2012-2013
ASHS Nominations and Elections Committee, 2010-
ASHS Outstanding International Horticulturist Award Committee, 2009-2012
ASHS Graduate Activities Committee, 2007-2009
Chair of ASHS Water Utilization and Management Working Group, 2008-2009
ASHS Ornamental publication award committee 2008-2011

Awards and recognitions 2007-2012
2012 SR-ASHS Blue Ribbon Extension Communication Award.
2011 Outstanding Specialist Award. Mississippi Association of County Agricultural Agents.
2011 John E. Hutchison Extension Award for Young Professionals, Southern Region-American Society for Horticultural Science
Charles R. Hall  
Ellison Chair in International Floriculture  
c-hall@tamu.edu  

**Program Summary**  
The mission of the Ellison chair in International Floriculture is to advance the health and vitality of the floriculture industry on a national and international scope through exemplary academic leadership, cutting edge applied research, innovative extension outreach programs, and by mentoring well-educated, impassioned leaders to support the future of floriculture. Five strategic objectives have been identified including: 1.) Increase funding for research and extension program in floriculture and related areas; 2.) Increase partnerships on a disciplinary and multidisciplinary in academia and industry; 3.) Increase numbers of top-quality undergraduate and graduate students in floriculture to meet growing needs; 4.) Increase program recognition for the TAMU floriculture program; and 5.) Increase vitality and productivity of programs in the identified areas of emphasis: a) economics and marketing; b) environmental sustainability; c) efficient production systems; and d) people development.

**Academic Background**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
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<tbody>
<tr>
<td>Ph.D.</td>
<td>1988</td>
<td>Mississippi State University</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>M.S.</td>
<td>1986</td>
<td>University of Tennessee</td>
<td>Ornamental Horticulture &amp; Landscape Design</td>
</tr>
<tr>
<td>B.S.</td>
<td>1984</td>
<td>University of Tennessee</td>
<td>Agricultural Economics &amp; Rural Sociology</td>
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**Professional Experience**

- Professor & Endowed Chair  
  Texas A&M University  
  Horticultural Sciences  
  August 16, 2007

- Professor - tenured  
  University of Tennessee  
  Agricultural Economics  
  February 2002

- Professor - tenured  
  Texas A&M University  
  Agricultural Economics  
  September 2001

- Associate Professor - tenured  
  Texas A&M University  
  Agricultural Economics  
  September 1997

- Assistant Professor  
  Texas A&M University  
  Agricultural Economics  
  December 1988

**Publications 2007-2012**

**Refereed Publications** (*underlined names indicate graduate students*)


- Campbell, Ben, Yue, Chengyan, Hayk Khachatryan, Charles Hall, Bridget Behe, Roberto Lopez, and Jennifer Dennis. 2012. **Consumer segments based on plant purchases reveal preferences for local and sustainable transplants.** Submitted to HortScience, August 2012, in revision.

- Yue, Chengyan, Hayk Khachatryan, Ben Campbell, Charles Hall, Bridget Behe, Roberto Lopez, and Jennifer Dennis. 2012. **The effects of the consideration of future consequences on willingness to pay decisions for plant attributes.** Submitted to the Journal of Environmental Policy, February 2012.


Editor reviewed publications or conference proceedings 2007-2012


Popular press articles 2007-2012


Hall, Charles. 2010. The view from 30,000 feet. GrowerTalks, 72(9).


**Electronic media/software (websites, software, videos, etc.) 2007-2012**

*Managing Risk in the Green Industry.* This strategic multi-faceted risk-management grant project funded by the Southern Risk Management Education Center involved innovative producer-oriented projects targeting nursery, greenhouse, and landscape operators. This first phase of this project used concepts from the “Green Industry Risk Management Guide” and the "2009 National Nursery Industry Survey" to formulate a series of educational materials that addressed timely green industry-related risk management issues. The second phase of the project involved integrating these materials into targeted face-to-face educational programs at several key industry events where attendance had been strong historically. The third phase of the project involved developing online webinars that have been shown to be an effective means of regional educational delivery in previous SRMEC projects. Lastly, the leading green industry blog entitled “Making Cents of Green Industry Economics” was used as an important outreach corollary to the online educational programs, as well as e-newsletters distributed by green industry trade organizations that served as project collaborators.

Administering an online blog entitled *Making Cents of Green Industry Economics.* To date, there have been 133,570 readers with 723 regular subscribers (as of December 31, 2011). This weblog provides up-to-the-minute information regarding economic factors affecting green industry businesses and the strategic responses to enhance profitability.

*Introductory Employee Training Program for Greenhouse Crop Production.* This training module is offered on the national eXtension website. The front end is tied to the Extension Conference Services website for fee processing depending on the funding strategy for the project. The fee-based program generates $55 per registration.

A video series entitled *Charlie's Angle* is distributed on the ANLA Knowledge Center. This series is a collaborative effort between Ball Horticultural Company, OFA, and ANLA and ties in with the Making Cents blog and other outreach activities of the Ellison Chair.

**Books or chapters in books 2007-2012**


**Patents / plant variety releases / plant variety patents**

None

**Classes taught (2007-2012)**

**Undergraduate courses**


**Graduate courses**
Taught a course entitled “Strategic Business Management” within the TAMU/UVG Masters Degree Program in Agribusiness, Guatemala City, Guatemala, 1997-present.

**Graduate students (2007-2012)**
**Advised/co-advised**

<table>
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<tr>
<th>Role</th>
<th>Student Name</th>
<th>Degree</th>
<th>Department</th>
<th>Year(s)</th>
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<tbody>
<tr>
<td>Committee Chair</td>
<td>Madeline Frazier</td>
<td>M.Agr.</td>
<td>Horticultural Sciences</td>
<td>2012-2013</td>
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<tr>
<td>Committee Member</td>
<td>Katie Klabunde</td>
<td>M.S.</td>
<td>Agricultural Economics</td>
<td>2012-2012</td>
</tr>
<tr>
<td>Committee Member</td>
<td>Matthew Murch</td>
<td>M.S.</td>
<td>Agricultural Economics</td>
<td>2012-2012</td>
</tr>
<tr>
<td>Co-Committee Chair</td>
<td>Amy Cai</td>
<td>PhD</td>
<td>Horticultural Sciences</td>
<td>2010-2013</td>
</tr>
<tr>
<td>Co-Committee Chair</td>
<td>Alba Collart</td>
<td>PhD</td>
<td>Agricultural Economics</td>
<td>2010-2013</td>
</tr>
<tr>
<td>Committee member</td>
<td>Rosa Rodales</td>
<td>M.S.</td>
<td>Environmental Horticulture</td>
<td>2010-2013</td>
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<tr>
<td>Committee Chair</td>
<td>Anthea Luo</td>
<td>M.S.</td>
<td>Horticultural Sciences</td>
<td>2010-2012</td>
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<tr>
<td>Committee member</td>
<td>Callie McAdams</td>
<td>M.S.</td>
<td>Agricultural Economics</td>
<td>2010-2011</td>
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<tr>
<td>Committee member</td>
<td>Travis Britt</td>
<td>M.Agr.</td>
<td>Horticultural Sciences</td>
<td>2009-2010</td>
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<tr>
<td>Committee Chair</td>
<td>Jay White</td>
<td>M.S.</td>
<td>Horticultural Sciences</td>
<td>2009-2012</td>
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<tr>
<td>Committee member</td>
<td>Alba Collart</td>
<td>M.S.</td>
<td>Agricultural Economics</td>
<td>2008-2009</td>
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<tr>
<td>Supervisor</td>
<td>Benjamin Campbell</td>
<td>Ph.D.</td>
<td>Agricultural Economics</td>
<td>2008-2009</td>
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<tr>
<td>Committee member</td>
<td>Yu-Jen Chen</td>
<td>M.S.</td>
<td>Agricultural Economics</td>
<td>2007-2008</td>
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**First job taken by each of your graduate students 2007-2012**
Data not available

**Graduate student committees (non-advisors)**
See table above.
Interdisciplinary program participation (2007-2012)
None.

Grants and contracts awarded 2007-2012

- $20,000  Analyzing the environmental impact (carbon footprint) and economic costs of field-grown flowering tree production system components. Funded by the Horticultural Research Institute. 2012-2013 Co-PI
- $29,900  The Color of Marketing: How much value do consumers place on green (sustainability) and blue (water conservation) marketing? Funded by the Horticultural Research Institute. 2012-2013 Co-PI
- $50,000  What Captures Consumers’ Attention When They Buy Ornamental and Food-Producing Plants? Approved for funding by the USDA Federal State Marketing Improvement Program (FSMIP). Co-PI’s include Bridget Behe (MSU), Ben Campbell (Vineland), Jennifer Dennis (Purdue), Roberto Lopez (Purdue), and Chengyan Yue (Minnesota). 2010-2012 Co-PI
- $34,000  A Social Media Guide for Floral Retailers and Wholesalers – Approved for funding by the American Floral Endowment. Co-Pi’s include Chengyan Yue (Bachman Chair, Univ. of MN) and Bridget Behe (MSU). 2011-2012 PI
- $48,311  Managing Risk in the Environmental Horticulture Industry – project funded by the Southern Region Risk Management Education Center. Marco Palma (TAMU) is Co-Investigator on the project. 2011/2012 Co-PI
- $85,875  Containment, Remediation, and Recycling of Irrigation Water for Sustainable Ornamental Crop Production. Funded by USDA-NIFA as part of the Sustainable Crops Research Initiative planning grant program. 2011/2012 Co-PI
- $48,000  Sustainability on the Table and In the Yard: Identifying, Profiling, and Quantifying Markets for Sustainably-Grown Ornamental and Food-Producing Plants. Approved for funding by the USDA Federal State Marketing Improvement Program (FSMIP), July 2008. Co-PI’s include Bridget Behe (MSU), Ben Campbell (Vineland), Jennifer Dennis (Purdue), Roberto Lopez (Purdue), and Chengyan Yue (Minnesota). 2011/2012 Co-PI
- $47,509  Managing Risk in the Green Industry – project funded by the Southern Region Risk Management Education Center. Marco Palma (TAMU) is Co-Investigator on the project. 2010/2011 PI
- $31,600  The effects of longevity information and guarantees on consumer preferences for cut flowers. This study investigates consumers’ preference and willingness to pay for specific longevity guarantees on cut flower arrangements; investigate consumers’ preference and willingness to pay for enhanced longevity through the addition of flower food or other treatments; and investigate customers’ preference and willingness to pay for flowers labeled with “expected longevity X days.” Approved for funding by the American Floral Endowment. Co-Pi’s include Chengyan Yue (Bachman Chair, Univ. of MN) and Bridget Behe (MSU). 2011/2012 Co-PI
- $25,000  Texas Department of Agriculture Specialty Crop Block Grant. Marco Palma (TAMU) is Co-Investigator on the project. 2009/2010 Co-PI
- $40,238  Green Industry Comprehensive Risk Management Education – a proposal funded by the Southern Region Risk Management Education Center. Marco Palma (TAMU) is Co-Investigator on the project. 2009-2010 Co-PI
- $20,000  Structural Changes in the U.S. Nursery Industry: An Assessment of Production and Marketing Trends – a proposal funded by the Horticultural Research Institute (ANLA) to conduct a national survey of nursery and greenhouse growers. 2009-2010 PI
- $23,705  Managing Risks in the Green Industry in Texas and the Southern U.S. -- a proposal funded by the Southern Region Risk Management Education Center. Marco Palma (TAMU) is Co-Investigator on the project. 2008-2009 Co-PI
- $96,684  Investigation of consumers’ and professionals’ perceptions, attitudes and behaviors about purchasing plastic alternatives and/or recycling plastic horticultural containers. Approved for funding by the USDA Federal State Marketing Improvement Program (FSMIP), July 2008. Co-PI’s include Bridget Behe (MSU), Jennifer Dennis (Purdue), and Chengyan Yue (Minnesota). 2008-2009 Co-PI
- $40,000  American Floral Endowment & Horticultural Research Institute proposal to determine the characteristics of biodegradable pots that consumers deem most desirable and to solicit their willingness-to-pay (WTP) for this type of sustainable product. Co-PI’s include Bridget Behe (MSU), Jennifer Dennis (Purdue), and Chengyan Yue (Minnesota). 2008-2009 PI
- $78,431  American Floral Endowment proposal to investigate 1) how and why younger and older consumers react differently to flowers and alternative gifts, 2) how younger and older consumers feel differently about the risks, the recipients’ positive or negative reaction associated with flowers and alternative gifts, 3) the impacts of positive information regarding flowers on consumers’ choices of gifts, and 4) what can be done by the floral industry to
improve younger and older consumers’ satisfaction with flowers. Co-PI’s include Bridget Behe (MSU) and Chengyan Yue (Minnesota). 2008-2009 Co-PI

$5,000 Grant from the Texas Ornamentals Enhancement Endowment to conduct an analysis of the awareness levels of the Texas Superstar and Earthkind “brands.” Marco Palma is the co-investigator. 2007-2009 Co-PI

$300,000 “Risk Management for the Environmental Horticulture Industry in the Southern United States” – a grant funded by the USDA/RMA Risk Management and Crop Insurance Education Commodity Partnership Program. Alan Hodges and John Haydu (Florida) were co-investigators. 2007-2008 Co-PI

$49,094 Managing Risk in the Green Industry – a grant funded to the Southern Region Risk Management Education Center. 2007-2008 PI

$38,000 Enterprise Budgets for Container-grown Woody Ornamental Plants, Climatic Zones 8 and 9 – a grant proposal funded by the Southern Region Risk Management Education Center. 2006-2008 Co-PI

$15,000 Risk Management Education for Commercial Vegetable and Fruit Producers in Tennessee – a grant proposal funded by the Southern Region Risk Management Education Center. 2006-2007 PI

$39,000 Regional Multi-state Enterprise Budgets for Fruit and Vegetable Crops - a grant proposal funded by the Southern Region Risk Management Education Center. 2006-2007 Co-PI

Review panels for grants and journals
Grant review panel service 2007-2012
None

Editorial boards on which you served 2007-2012
Consulting Editor of HortTechnology

Journals for which you reviewed papers 2007-2012
HortTechnology
HortScience

Internal university / agency service on committees 2007 – 2012
Member of the College of Agriculture and Life Sciences Peer Review Committee, 2012-2013.
Member of the TAMU Association of Former Students Distinguished Achievement Awards selection committee, 2011.
Chair of departmental search committee, Extension Sustainable Landscape Management position, 2011.
Member of Graduate Program Committee, Department of Horticultural Sciences, 2011-2012.
Chair of departmental search committee, Benz Chair of Floral Design, 2010.
Chair of departmental Master’s of Horticulture development committee, 2009-2010.
Chair of departmental Branding Strategy Committee, 2008.
Chair of departmental Floriculture Degree Evaluation Committee, TAMU, 2007.
Member of Statewide Research Plan committee, Department of Horticultural Sciences, TAMU, 2007.

Professional association leadership roles 2007-2012
Co-hosted the 2011 National Floriculture Forum in Dallas, Texas. The NFF meeting website resides on the Ellison Chair website (http://ellisonchair.tamu.edu/conferences-workshops/2011nff).
Serving on the Board of Directors of America in Bloom, 2010-2012.
Serving on the Board of Directors for the Seeley Conference, 2010-2012.
Serving on the Board of Directors for Smithers-Oasis, Inc., 2009-2012.
Serving as a member of the TNLA Education Committee, 2011-2012
Serving as a member of the OFA Grower Committee, 2009-2012.
Serving as a member of the SAF Member Services Committee, 2010-2012.
Hosted the Board of Directors meeting of the America Floral Endowment (endowment.org), Jan 2012.
Served as Conference Coordinator for the 2010 Seeley Conference.
Member of SAF Business & Economic Trends Committee, 2009.
Member of the Texas Nursery and Landscape Association Education Committee, 2009-2010.
Chair of Southwest Growers Conference Steering Committee, 2007-2008.
Facilitated the strategic planning sessions for the Tennessee Nursery and Landscape Association, June 2006 and June 2007.
Member of the Tennessee Nursery and Landscape Association Education Committee, 2004-2007.
Member of the Tennessee Fruit and Vegetable Conference Planning Committee, 2004-2007
Member of S1019 (formerly S222) Multi-state Regional Research Committee. Project entitled "Fruit and Vegetable Marketing Innovations and Demand Assessment", 1992-present.
Member (and Chair for 4 years) of S1021 (formerly S290 and S103) Multi-state Regional Research Committee. Project entitled "Technical and Economic Efficiencies of Producing and Marketing Landscape Plants, 1989-present.

Awards and recognitions 2007-2012
Named the 2012 Hort Hero by Greenhouse Product News magazine.
Received the Porter Henegar Memorial Award from the Southern Nursery Association for significant contributions to ornamental horticulture research and to the Southern Nursery Association, January 2012.
Received the ARP Award from the Texas Nursery and Landscape Association for outstanding service to the green industry, August 2011.
Received the Hall of Fame & Honorary Lifetime Member Award from the Tennessee Nursery & Landscape Association, February 2008.
Edward W. Hellman  
Professor of Viticulture  
ewhellman@ag.tamu.edu

Program Summary 2007-2012
Dr. Hellman holds joint appointments with Texas A&M AgriLife Extension (75%) and Texas Tech University (25%), serving on the graduate faculties of both universities and conducting extension, teaching and research programs. Extension activities include management of the Texas Winegrape Network website as the cornerstone of the Viticulture Extension program, and the Texas Viticulture Certificate Program. He also developed the Vineyard Doctor online diagnostic system and the Great Vineyards Program. Hellman led the statewide Viticulture Extension Team (4.0 FTE); leadership activities included assessing regional needs from advisory committees, setting statewide program priorities, approving annual plans of work, providing professional guidance and technical viticulture support, budget management, personnel supervision, and related administrative duties. Two innovative and impactful programs developed by Hellman and implemented by the Viticulture Extension Team are the Prospective Winegrower Workshops, which facilitates expansion of vineyard acreage, and the Great Vineyards Program, which focuses on encouraging best management practices. A new publication was developed by the Team, the 2012 Texas Grape Spray Guide. It provides regional recommendations on disease and insect control products.

Hellman teaches one undergraduate and one graduate course at Texas Tech University. His viticulture research program involves collaborative investigation of the physiology of grapevine adaptation to climate, evaluation of grape cultivars and rootstocks, and analysis of climatic and edaphic conditions of Texas winegrowing regions. A recent area of emphasis is development of a GIS system for vineyard site assessment and matching grape variety to climate. Completion of this project will provide a rich database for exploring grape variety adaptation to environmental conditions.

Academic Background

<table>
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<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
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<tbody>
<tr>
<td>Ph.D.</td>
<td>1982</td>
<td>University of Arkansas</td>
<td>Plant Sciences</td>
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<tr>
<td>M.S.</td>
<td>1980</td>
<td>University of Illinois</td>
<td>Horticulture</td>
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<tr>
<td>B.S.</td>
<td>1977</td>
<td>University of Illinois</td>
<td>Horticulture</td>
</tr>
</tbody>
</table>

Professional Experience:

2007-present  
Professor and Extension Specialist, Texas A&M AgriLife (75%)  
Professor of Viticulture, Texas Tech University (25%)

2000-2007  
Associate Professor and Extension Specialist, Texas A&M (75%)  
Associate Professor of Viticulture, Texas Tech University (25%)

1994-2000  
Associate Professor and Extension Horticulturist, Oregon State University. (100% Extension)

1990-1994  
Associate Professor of Horticulture, Kansas State University. (60% Teaching, 40% Research)

1984-1990  
Assistant Professor of Horticulture, Kansas State University (60% Teaching, 40% Research)

1983-1984  
Assistant Professor of Viticulture, Florida A&M University

1980-1982  
Graduate Research Assistant, University of Arkansas

1978-1979  
Graduate Research Assistant, University of Illinois

Publications 2007-2012

Refereed Publications (underlined names indicate graduate students in the faculty members lab)


Editor reviewed publications or conference proceedings 2007-2012


Popular press articles 2007-2012


Extension Publications 2007-2012


Hellman, E.W. 2008. Sustainable Viticulture Resources
   http://winegrapes.tamu.edu/grow/sustainablevitic.html
   http://winegrapes.tamu.edu/grow/organicmethods.html
Hellman, E.W. 2008. Grape Gardening Resources
   http://winegrapes.tamu.edu/grow/gardening.html
   http://winegrapes.tamu.edu/grow/bunchrot.html

Electronic media/software (websites, software, videos, etc.) 2007-2012

Websites
Hellman, E.W., F.A. Westover, and D. Holman. 2012. The Vineyard Doctor. (decision-support problem diagnostic system)
https://vineyarddoctor.tamu.edu

http://www.extension.org/grapes

http://txwineregions.tamu.edu

CDROM

Classes taught (2007-2012)
Undergraduate courses

Graduate courses

Graduate students (2007-2012)
Advised/co-advised
Michael Krawitzky M.S., Horticulture, 2009, Texas Tech University

Graduate student committees (non-advisees)
Yanmei Zhang, M.S., Plant & Soil Science, Texas Tech U. 2012
Christi Townsend, Ph.D., Geography, 2012, Texas State University
Daniel Pate, M.S., Agric. & Applied Econ., 2011, Texas Tech U.
Elvis Takow, M.S., Rangeland Ecology & Mgt., 2008, Texas A&M

Interdisciplinary program participation (2007-2012)
None

Grants and contracts awarded 2007-2012
$200,000. Developing and Maintaining Viticulture Education Programs. Texas Department of Agriculture, Enology and Viticulture Extension and Research Grant Program. 2011-2013.
$250,000  Viticulture Research to Increase Yields and Enhance Quality. Texas Department of Agriculture, Enology and Viticulture Extension and Research Grant Program. Hellman, E.W. and T. Montague. (Hellman portion $125,000). 2010-2012.


$65,000 Enhancing Academic Programs in Viticulture and Enology at Texas Tech University. Texas Department of Agriculture, Enology and Viticulture Extension and Research Grant Program. (Hellman portion $13,000). Thompson, T., B. Trela, E.W. Hellman, T. Montague, and C. McKenney. 2010-2012.


$20,000 Renovation of the Viticulture Field Laboratory into a Viticulture and Enology Laboratory. Wine & Food Foundation of Texas. 2007.


Review panels for grants and journals
Grant review panel service 2007-2012
None.

Editorial boards on which you served 2007-2012
None.

Journals for which you reviewed papers 2007-2012
American Journal of Enology and Viticulture
HortScience
HortTechnology
Journal American Pomological Society
Environmental Modeling & Software
Journal of Maps

Internal university / agency service on committees 2007 – 2012
Horticultural Sciences Tenure and Promotion Committee, 2007-present
Search Committee, Enology Faculty, Nutrition & Food Science, 2006-2007

Professional association leadership roles 2007-2012
Technical Program Committee, American Society Enology and Viticulture, 2011-present
Board of Directors, National Grape and Wine Initiative, 2004-present
Chair, Extension and Outreach Education Committee, National Grape & Wine Initiative. 2004-2009; 2012
Research Committee, National Grape and Wine Initiative, 2012
Executive Committee, National Grape and Wine Initiative, 2007-2009
Wilder Medal Committee, American Pomological Society, 2008-2010
Guidance Committee, Viticulture Consortium – West, 2006-2009
Technical Projects Committee, American Society for Enology and Viticulture. 2003-2009
Moderator, 2008 National Viticulture Research Conference
Chair, Outstanding Researcher Award Selection Committee, American Society for Horticultural Science, 2008
Chair, NE1020: Multi-state Evaluation of Winegrape Cultivars and Clones, 2007

Awards and recognitions 2007-2012
James Stanley Kamas  
Asst. Professor & Extension Specialist - Viticulture & Pomology  
j-kamas@tamu.edu

Program Summary  
Jim Kamas has a 100% Extension appointment with the Texas A&M AgriLife Extension Service and works as an extension fruit specialist, stationed in Fredericksburg, TX. Jim is active in applied research projects evaluating new and heirloom Pierce's disease resistant grape varieties, the impact of grape rootstocks on vine performance and disease tolerance and the management of cotton root rot in Texas vineyards. Through on-site visitations, phone and email contacts, he assists commercial and home growers with cultural practice problems including fruit nutrition, pruning and crop-load management, orchard/vineyard ground cover management and disease and insect control. Kamas is active in the national Pierce's disease research and education effort and currently serves as the outreach coordinator for the Texas Pierce's Disease Research & Education Program.

Academic Background  
B.S. Horticultural Sciences, 1977, Texas A&M University  
M.S. Horticultural Sciences, 1982, Texas A&M University

Professional Experience  
March 1996- Present- Asst. Professor & Extension Specialist- Viticulture & Pomology, Texas A&M AgriLife Extension Service, Fredericksburg, Texas

May 1988- March 1996-Area Extension Grape Specialist & Extension Team Leader Lake Erie Regional Grape Program  
Cornell University/Penn St. University

September 1980-September 1983-Instructor, Department of Horticultural Sciences, Texas A&M University, College Station, Texas. (Introductory Pomology, Temperate Fruit Production, Undergraduate Honors Program)

January 1978-September 1983-Research Associate, Texas Agricultural Experiment Station, College Station, Texas (Fruit Breeding and Variety Development)

Refereed Publications  


**Extension Publications**


**Professional Committee Involvement**

California Dept. of Food & Ag./PIGRA Transgenic Pierce's Disease Material Review Committee 2012- Present

California Dept. of Food & Ag. Glassy Winged Sharpshooter Scientific Advisory Committee Meeting 2001-present

Viticulture Consortium East- Regional Guidance Committee 2006-2011, Geneva, NY. Reviewed all proposals submitted to VC-East and participated in discussion and allocation of research fundss.

**Proposal & Book Chapter Reviews**

2013 Reviewed chapters for Compendium of Grape Diseases, American Phytopathological Society Press

2009/10 Reviewed Research Proposals for the California Dept. of Food & Agriculture's Competitive Pierce's Disease Research Program

2008- Reviewed Research Proposals Submitted to the Missouri Wine Grape Board

**Grants & Contracts Awarded- 2007-2012**

$125,300 2012-2013. J. Kamas & M. Black. Identifying Superior Pierce's Disease Varieties and Rootstocks, Texas Dept. of Agriculture, Specialty Crop Research Initiative Block Grant.


$147,897 2010-2011. J. Kamas. Evaluation of Traditionally Bred PD Tolerant Vitis Germplasm with Potential Tolerance to Pierce's Disease, and Extension Outreach for Texas and Other Eastern U.S. Grape Growing Regions. USDA/APHIS Cooperative Agreement

$68,948 2009-2010. J. Kamas. Evaluation and Investigation of Vitis Germplasm with Potential Tolerance to Pierce’s Disease, and Pierce’s Disease Extension Outreach for Texas and Other Areas Affected by Pierce’s Disease. USDA/APHIS Cooperative Agreement


Patricia Elaine Klein
Associate Professor
pklein@tamu.edu

Program Summary
Dr. Klein holds a split appointment between teaching and research. Teaching responsibilities include two undergraduate courses in the field of general Horticulture and Garden Science. She also serves as the chair of two Ph.D. student committees and as a member of an additional seven graduate student committees outside the Department. Her research program focuses on developing the genomic tools and resources in cereal crops to enable map base cloning of genes of economic/agronomic importance, to understand the underlying mechanisms that plants use to withstand abiotic stress (particularly drought stress), and to aid in the development of plant feedstocks for the emerging biofuels industry. More recently her program has broadened into the area of invasive species and her group is working to establish a population genetic profile of the invasive weed, *Imperata cylindrica*, as a first step in the development of a host-specific biological control for this federal noxious weed. Much of Dr. Klein’s program has been aimed at developing genomic tools and resources for sorghum, a model C4 cereal grass. These efforts have resulted in the construction of an integrated genetic, physical, cytogenetic and comparative map of the sorghum genome, development of more than 200,000 sorghum ESTs, development and use of microarray, RT-PCR and RNA-Seq technology for the analysis of gene expression in response to biotic and osmotic stress, and development of genotyping-by-sequencing technology for sorghum and other C4 grasses. Dr. Klein is actively engaged with other members of the Horticulture Department to transfer much of this genomic technology to additional crops including rose and pecan. In a service capacity, Dr. Klein is an Associate Editor of *The Plant Genome* and serves as an advisory board member for Gramene, the grass comparative genomics database.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
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<tbody>
<tr>
<td>Ph.D.</td>
<td>1989</td>
<td>Texas A&amp;M University</td>
<td>Biochemistry</td>
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<td>M.S.</td>
<td>1984</td>
<td>Texas Tech University</td>
<td>Crop Science</td>
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<tr>
<td>B.S.</td>
<td>1982</td>
<td>Texas A&amp;M University</td>
<td>Horticulture</td>
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Professional Experience:
2002 – present  Associate Professor, Dept. of Horticultural Sciences, Texas A&M University (2002-2008: 90% research, 5% teaching, 5% service; 2008-present: 65% research, 30% teaching, 5% service)
2001-2002  Assistant Professor, Institute for Plant Genomics and Biotechnology, Texas AgriLife Research (90% research, 5% teaching, 5% service)
1997-2001  Assistant Professor, Dept. of Biochemistry and Biophysics, Texas AgriLife Research (90% research, 5% teaching, 5% service)
1995-1997  Research Associate, USDA-ARS, Eastern Regional Research Center, Wyndmoor, PA (100% research)
1993-1994  Assistant Professor, Dept. of Horticulture & Landscape Architecture, University of Kentucky (75% research, 25% teaching)
1989-1992  NSF Postdoctoral Fellow, Dept. of Plant Pathology, University of Kentucky (100% research)

Publications 2007-2013

Refereed Publications (underlined names indicate graduate students in the faculty members lab)
Acad. Sci. USA. **108**: 16469-16474.


**Editor reviewed publications or conference proceedings 2007-2012**


Electronic media/software (websites, software, videos, etc.) 2007-2012
Maintain one class website and one research website:
HORT 301 website: https://www-horticulture.tamu.edu/courses/course/view.php?id=49
Research website: http://sorgblast3.tamu.edu

Books or chapters in books 2007-1012
None

Patents / plant variety releases / plant variety patents

Classes taught (2007-2012)
Undergraduate courses
Horticulture 201H, Horticultural Sciences and Practices – Honors Section, Fall 2009 and 2011
Horticulture 301, Garden Science, Spring 2012 and 2013
Horticulture 491, Undergraduate Research, Spring 2010
Genetics 491, Undergraduate Research, Fall 2010
Genetics 491, Undergraduate Research, Fall 2011

Graduate courses
Horticulture 691, Research, each semester year-round, Spring 2012-present
Molecular and Environmental Plant Science 691, Research, each semester year-round, Fall 2012-present

Graduate students (2007-2012)
Advised/co-advised
Jason Anderson. 2010. Ph.D. Cytogenomic Analyses of the Genus Sorghum. (Co-advised with Dr. David Stelly)

First job taken by each of your graduate students 2007-2012
Jason Anderson, Biology Faculty, Louisiana School for Math, Science and the Arts.
Bin Zhou, Research Scientist, Novavax, Rockville, MD.

Graduate student committees (non-advises)
Adam Mahan. Current student, Ph.D., Department of Soil and Crop Sciences. Estimation and validation of effective meiotic recombination rate variation and its importance from a large maize population with different line-cross designs.
John Gill. Current student, Ph.D. Plant Breeding, Department of Soil and Crop Sciences, Intergeneric hybridization in sorghum.
Matt Bartek. Current student, Ph.D. Plant Breeding, Department of Soil and Crop Sciences, Development of sorghum x sugarcane hybrids and their characterization.
Xiuting Zheng. Current student, Ph.D., Molecular and Environmental Sciences, Analysis and breeding of reniform nematode-resistant cottons by marker-assisted selection.
Melissa Ganotis. Current student, Ph.D. Plant Breeding, Department of Soil and Crop Sciences. Mapping kernel traits in a sorghum RIL population.
Herb Dustin. Current student, M.S. Plant Breeding, Department of Soil and Crop Sciences. Analysis of bioenergy related traits in a sorghum energy association panel.

Sabyasachi Mandal. Current student, Ph.D., Department of Biology. Project in preparation.


Terry Felderhoff. 2011. M.S., Plant Breeding, Department of Soil and Crop Sciences, QTLs for energy related traits in a sweet x grain sorghum (Sorghum bicolor L. Moench) population.

Karen Harris. 2007. Ph.D., Department of Biochemistry and Biophysics, Genetic analysis of the Sorghum bicolor stay-green drought tolerance trait.

Brian O’Shea. 2007. Ph.D., Veterinary Microbiology, Genetic analysis of Mycobacterium avium subspecies paratuberculosis reveals sequence and epigenetic variation among field isolates.

Jeff Brady. 2006. Ph.D., Genetics, Sorghum Mas and Mas maturity genes.

Merribeth Henry. 2006. M.S., Department of Plant Pathology, Characterization of Sclerotinia minor populations in Texas.

Sanghyun Lim. 2006. M.S., Molecular and Environmental Plant Sciences, Sorghum gene expression modulated by water deficit and cold stress.

Interdisciplinary program participation (2007-2012)
Molecular and Environmental Plant Sciences Faculty

Grants and contracts awarded 2007-2012

- $323,000 A Population-Genetic Inventory of the Invasive Weed, Imperata cylindrica, to Expedite the Development of Viable Biological Controls. USDA-NIFA. Funded $500,000 ($323,000 to P. Klein). 2012-2016.


$65,000 Improving Sorghum Genome Resources for Cereal Crop Improvement. USDA – Specific Cooperative Funded $65,000. 2009-2014.


Review panels for grants and journals

Grant review panel service 2007-2012
USDA-NIFA, 2011
External grant reviewer for The Missouri Life Science Research Board for 2007

Editorial and Advisory boards on which you served 2007-2012

*The Plant Genome*, Associate Editor, 2005-present
Scientific Advisory Board for Gramene, member, 2005-present
Scientific Advisory Board for the Sorghum Translational Genomics Program at Kansas State University, member, 2007-2010

Journals for which you reviewed papers 2007-2012

*Theoretical and Applied Genetics*
*BMC Genomics*
*Plant Physiology*
*Crop Science*
*PLoS One*
*Genetics*
*Molecular and General Genomics*
*BMC Plant Biology*
*Genetics*

Internal university / agency service on committees 2007 – 2012
TAMU Institutional Biosafety Committee, member, 2003 – present.
TAMU Department of Horticultural Sciences Graduate Program Committee, member, 2011 – present.
TAMU Department of Horticultural Sciences Scholarship Committee, 2011 – present.
TAMU Department of Horticultural Sciences Ad hoc committee for development of a Master’s of Horticulture degree program, member, 2010.
TAMU Institute for Plant Genomics and Biotechnology, Business Administrator Search Committee, member, February 2013.
TAMU Institute for Plant Genomics and Biotechnology, Facilities Coordinator Search Committee, member, March 2012.
TAMU Institute for Plant Genomics and Biotechnology, Computer/Bioinformatics Committee, Chair, 2011-present
TAMU Institute for Plant Genomics and Biotechnology, Growth Chamber/Greenhouse Committee, member, 2005-present.
TAMU Molecular and Environmental Plant Sciences Interdisciplinary Program, Graduate Admissions Committee, member, 2012-present.
TAMU Molecular and Environmental Plant Sciences Interdisciplinary Program, Nomination Committee, member, 2010.
TAMU Department of Soil and Crop Sciences, Quantitative Genetics – Assistant Professor Search Committee, member, 2007-2008.

Professional association leadership roles 2007-2012
None

Awards and recognitions 2007-2012
2012 College of Agriculture and Life Sciences Dean’s Outstanding Achievement Award for Interdisciplinary Research.
Hisashi Koiwa
Associate Professor
koiwa@tamu.edu

Program Summary
Dr. Koiwa’s research program focuses on molecular basis for plant abiotic stress tolerance. Dr. Koiwa uses a model plant Arabidopsis thaliana and aim to identify genes important for osmotic stress responses/tolerance and determine their cellular functions. Particular emphasis is in protein phosphatases that belong to plant RNA polymerase II carboxyl-terminal phosphatase-like (CPL) family, that are presumed important for global transcriptional regulations. In particular, Dr. Koiwa’s group focuses on CPL1 and its roles in osmotic stress responses and iron deficiency signaling.
Dr. Koiwa’s group also studies regulation of plant salt/osmotic stress response that operates at post-translational N-glycosylation of proteins. Complex N-glycans that are synthesized in the Golgi determine salt/osmotic stress tolerance of root growth. Interestingly, N-glycan modification regulates cellulose biosynthesis pathway. A cell-wall-based osmotic stress tolerance determinant, KORRIGAN1, was identified and its mode of function is under investigation.
In Teaching, Dr. Koiwa offer two graduate courses and 1 graduate lab course. Dr. Koiwa currently advise two Ph.D., student as a chair and serves on thesis committee of 4 other students.
In a service capacity, Dr. Koiwa serves on Horticulture Graduate Program Committee, MEPS executive committee and chairs MEPS2013 symposium program committee. Dr. Koiwa also serves on the editorial board for The Journal of Biological Chemistry.

Academic Background

<table>
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<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
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</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>1996</td>
<td>Kyoto University, Kyoto, Japan</td>
<td>Agricultural Chemistry</td>
</tr>
<tr>
<td>M.S.</td>
<td>1993</td>
<td>Kyoto University, Kyoto, Japan</td>
<td>Agricultural Chemistry</td>
</tr>
<tr>
<td>B.S.</td>
<td>1991</td>
<td>Kyoto University, Kyoto, Japan</td>
<td>Agricultural Chemistry</td>
</tr>
</tbody>
</table>

Professional Experience:

- **Sep, 2008-present**
  Associate Professor, Dept of Hort. Sci., Texas A&M University
  (65% Research, 30% teaching, 5% service)
- **Aug, 2002-Aug 2008**
  Assistant Professor, Dept of Hort. Sci., Texas A&M University
  (50% research, 50% teaching)
- **1999-Aug, 2002**
  Research Plant Biologist, Dept of Hort. & LA, Purdue University

Publications 2007-2012

Refereed Publications *(underlined names indicate graduate students in the faculty members lab)*

phosphatase-like 2 regulates plant growth, stress and auxin responses, Plant Mol. Biol. 67, 683-697.


Classes taught (2007-2012)

Graduate courses
MEPS610/HORT610 (initially taught as a MEPS/HORT 689), Physiological and Molecular Basis for Plant Stress Responses Fall 2003, 2005, 2006, 2008, 2012 at Texas A&M University
MEPS689/HORT689, Physiological and Molecular Basis for Plant Stress Responses (Lab) Fall 2012 at Texas A&M University.
Graduate students (2007-2012)
Advised/co-advised
Yue Feng 2010 Ph. D.
Emre Aksoy Current Student
Akihito Fukudome Current Student

Graduate student committees (non-advisees)
Lavanya Reddivari- Ph.D. Horticulture (Graduated in 2007)
Ji-Eun An- Ph, D. Entomology (Graduated in 2008)
Nan-yen Chou- M.S. MEPS (Graduated in 2008)
Jessica J. Cmperlik- M.S. Plant Pathology (Graduated in 2008)
Joonhee Shin- M.S. Plant Pathology (Graduated in 2010)
Daniel Jacobo- Ph, D. Food Sci. (Graduated in 2010)
Shawn Christensen - Ph, D. Plant Pathology (Graduated in 2010)
Yong-Soon Park - Ph, D. Plant Pathology (Graduated in 2011)
Jinhee Kim- Ph, D. HORT (Graduated in 2011)
Murli Manor- Ph, D. MEPS (Graduated in 2012)
Anna Nelson- Ph.D. Molecular Cellular Biology (Graduated in 2012)
Jiaxin Lei- Ph. D. MEPS (Current)
Chi Yao – M.S. Soil and Crop Science (Current)
Desiree Kohn- M.S. MEPS (current)

Direction of Undergraduate Projects
Maria Lee (Spring 2007)
Edwin Mendez (Fall 2008)
Trevor Broyles (Summer/Fall 2011)
Justin Welch (registered for Fall 2012)

Grants and contracts awarded 2007-2012
NSF: (2004-2009) PI
Regulation of plant osmotic-stress-induced gene expression by unique Ser 5-specific RNAP II CTD phosphatases
$405,999

NSF: (2010-2013) PI (with 1 co-PI)
Role of Arabidopsis CTD-phosphatase-like 1 in gene silencing pathway $958,530 ($571,006 to HK)
Research Experience Undergraduate supplement (2011) $7,000
Research Experience Undergraduate supplement (2012) $7,000

USDA-CSREES: (2007-2008), Co-PI
Designing Food for Health: Determine optimum conditions for producing health-promoting antioxidant levels in vegetables using model and crop plants with osmotically-inducible master-switch transcriptional regulator genes. $24,000 (total of $1,270,000 to all Co-PI’s)

USDA-CSREES (2008-34402-19195), Co-PI
The mechanism of gene expression that regulates inducible phytochemical accumulation in vegetables $23,000 (total of $1,375,095 to all Co-PI’s)

USDA-CSREES (2009-34402-19831), Co-PI
Designing Food for Health: Determining stress signature phenylpropanoid profiles of transgenic plants that overproduces regulatory transcription factors upon osmotic stresses $25,000 (total of $1,291,218 to all Co-PI’s)

USDA-CSREES (2010-34402-20875), Co-PI
Determine the mechanism of phytochemical overproduction in Arabidopsis fyr2-1 mutant $22,000 (total of $ 1,288,975 to all Co-PI’s)

USDA-CSREES (2009), VFIC director’s award for research excellence grant $5,000

Gift: Gyeongsang National University, Jinju, South Korea:
Studies for molecular analysis of Arabidopsis osmotic stress responses, $3,000

Service fee: Henningsen Food, Inc $600

Internal funding
TAES equipment grant (2005):
Ultra-sensitive low light imaging system for studying stress-responsive transcriptions in Arabidopsis thaliana  $28,000

TAES equipment grant (2006):
Renovation of Controlled Environment Growth Rooms in Horticulture and Forest Science Building For Functional Genomics of Plant Drought and Osmotic Stress Tolerance  $36,000

TAES equipment grant (2007):
Renovation of Controlled Environment Growth Rooms in Horticulture and Forest Science Building For Functional Genomics of Plant Drought and Osmotic Stress Tolerance  $20,000

Texas Agrilife Research equipment grant (2008):
Upgrading Dept. Horticultural Science Shared-Use Lab Microscope and Imaging Facility for ultralow-light in vivo microimaging  $22,000

Texas Agrilife Research equipment grant (2009) (PI, with co-PI, E.A. Pierson):
The 3rd Phase of Renovation of Controlled Environment Growth Rooms and an incubator in Horticulture and Forest Science Building For Functional Genomics of Plant Drought and Osmotic Stress Tolerance and Disease Resistance  $21,000

International Research Travel Assistance Grant (2006):
Research travel to Germany  $1,750

Experiential Learning Undergraduate (COALS) (2011)  $500
Experiential Learning Undergraduate Research (Horticulture) (2012)  $1,000

Funding for a conference organized by the applicant
External grant
NSF: Meeting: MEPS 2013: Plant Signaling Systems-From Cells to Environment, College Station, TX$13,000

Industrial contribution
Nikon Instruments, USA  $500

Internal allocations
College of Agriculture and Life Science  $2,900
Office of Graduate Studies  $500
Departmental Contributions  $1,500

Review panels for grants and journals
Grant review panel service 2007-2012
NSF Molecular and Cellular Biology panel (November 2011)

Editorial boards on which you served 2007-2012
Journal of Biological Chemistry, 2010-present

Journals for which you reviewed papers 2007-2012
Biologia Plantarum
BioMed Central Research Notes
Journal of Experimental Botany
Journal of Plant Research
Molecular Plant
Open Plant Science Journal
Phytochemistry
Plant Cell, and Environment
Plant Cell Physiology
Plant Journal
Plant Physiology
Planta
PLoS ONE
Proc. Natl. Acad. Sci. USA

Internal university / agency service on committees 2007 – 2012
HORT seminar committee, Spring 2004-present
Seminar host for Dr. C. Carter (Fall 2007); Seminar host for Dr. N. Dudareva (Spring 2008)
Seminar host for Dr. A. Smith (Fall 2012)
Texas A&M University MEPS executive Committee, 2012 – present.
Texas A&M University MEPS young investigator award selection committee 2011
TAMU Department of Horticultural Sciences Graduate Program Committee 2012-
TAMU Borlaug Center External Advisory Committee (2006-present)
Search committee
  Plant Breeding position for Department of Horticultural Science (2007-2008)
  Borlaug Center Faculty Search Committee (2008-2009)

Awards and recognitions 2007-2012
2009  VFIC Director’s Award for Research Excellence, Texas A&M University
2010  MEPS Young Investigator Award, Texas A&M University
Daniel Ivan Leskovar  
Professor of Vegetable Stress Physiology and Resident Director of the Texas A&M AgriLife Research & Extension Center at Uvalde  
d-leskovar@tamu.edu

Program Summary
Dr. Leskovar’s research program is centered in the understanding of plant morphological and physiological adaptation mechanisms to environmental stresses and in the development of integrated sustainable vegetable cropping systems. Crops of interest include leafy vegetables, watermelon, melon, onion, tomato and sweet pepper as well as specialty hot peppers, artichokes, and Tuscan melons. His research emphasis is on: 1) seed-transplant production and physiology to increase plant survival and enhance stand establishment; 2) plant hormones to modulate seedling, plant and fruit growth, 3) root/shoot developmental responses to water conservation strategies, deficit irrigation management and irrigation technologies (drip, center pivot and hydroponics), 4) impact of cropping systems on water productivity, yield, antioxidants, and sensory attributes of vegetable crops, and 5) genotype by environment interaction (GxE) for root growth, drought resistance, high yield, quality, and phytochemical content. The first two areas are looking at optimizing hormonal applications in the nursery to mitigate the negative effects of transplant shock that lead to poor stand establishment in the field. His lab has documented the positive effect of ABA on regulating transpiration, while maintaining a favorable water status, and control of root/shoot growth in several species, including pepper, tomato, melon, watermelon and artichoke. The water conservation project integrates soil and canopy sensing systems, irrigation technologies, tillage practices, and improved genetic materials with adaptation to semi-arid conditions. His program is also developing integrated crop production systems of specialty vegetable crops for Texas (e.g. artichokes, specialty melons). Approaches include precision planting, variable plant populations, limited irrigation strategies, N management, and spatial and temporal variety testing.

Academic Background

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<th>Institution</th>
<th>Major</th>
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<tr>
<td>Ph.D.</td>
<td>1991</td>
<td>University of Florida</td>
<td>Vegetable Crops Physiology</td>
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<tr>
<td>M.S.</td>
<td>1986</td>
<td>University of California, Davis</td>
<td>Vegetable Crops</td>
</tr>
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<td>B.S. Training</td>
<td>1983</td>
<td>University of Wageningen, Holland</td>
<td>Vegetable Crops</td>
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<tr>
<td>B.S.</td>
<td>1977</td>
<td>University of Comahe, Argentina</td>
<td>Horticulture</td>
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</table>

Professional Experience
2011 - Center Director, Texas A&M AgriLife Research Uvalde  
2006 - Assistant Director- Vegetable and Fruit Improvement Center, Texas A&M  
2004 - Professor, Vegetable Stress Physiology, Texas A&M University  
1997-2003 Associate Professor, Vegetable Physiology, Texas A&M University  
1991-1996 Assistant Professor, Vegetable Physiology, Texas A&M University  
1988-1990 Graduate Research Assistant, University of Florida  
1986-1987 Laboratory Assistant, Tissue Culture, University of Florida

Publications 2007-2012

Refereed Publications (underlined names indicate graduate students in the faculty or co-faculty members lab)  


Electronic media/software (websites, software, videos, etc.) 2007-2012

http://vocuspr.vocus.com/vocuspr30/Publish/513992/Forward_513992_1498182.htm?Email=d-leskovar@tamu.edu&Date=10%2f11%2f2010+4%3a41%3a33+PM (Oct. 2010)
Texas Gardener. Jan. 09. Artichoke and Cardoon
KKVX Radio Show interview. Artichoke growing in TX, Dec. 10.2008
KKVX Radio Show interview. Dec. 19.08. Pepper growing in TX.

Books or chapters

Patents / plant variety releases / plant variety patents (collaborator)
2011 Jalapeno pepper inbred lines: GHS10-01, GHS10-02, GHS10-07, GHS10-08, GHS10-09, GHS10-11, GHS10-14, GHS10-15, GHS10-23, GHS10-50, GHS10-52-1, GHS06-78, GHS10-TMJ3, GHS10-UV81-1
2011 Habanero pepper: IL88-04 Habanero, UV45-04 Habanero, UV45-04 Habanero
2009 Cayenne pepper: S04408-6-4-1
2009 Jalapeno pepper: F07404, F07442 F07489, F0749; F07502, F07509, F06087
2009 Serrano pepper: S07432-2-1-1-1, S05126-41-1-1, F05155-45-1-1-a, F05006-33-3-3-1
2007 Habanero pepper: TMH (PVP)

Classes taught (2007-2012)

Graduate courses and classes
Fall 2012 Class HORT 325. Vegetable Crop Production, Irrigation practices. Dept. Hort. Sciences, Texas A&M
Spring 2011 Graduate course ‘Roots: The foundation of growth, yield and quality’. Universidad Politecnica de Cartagena, Spain.

Graduate students (2007-2012)
Advised/co-advised
Shinsuke Agehara, Ph.D. (Horticultural Sciences, current). ABA and stress tolerance.
M.S. Christina Bishop, MS (Ecosystem Science and Management, current)
Y. Wen, Ph.D. (Soils and Crops, completed, 2011). Cotton production under traditional and regulated deficit irrigation schemes in southwest Texas.

M.S. Naoko Nomura, MA (Horticultural Sciences, completed 2011). Variation of phenolics in red and white Texas wines

Nuria Pascual Seva, Ph.D. (Universidad Politecnica de Valencia, Spain, completed 2010). Estudios agronómicos sobre el cultivo de la chufa (Cyperus esculentus, L. var. sativus Boeck.): estrategias de riego, tipos de plantación, análisis fitoquímico, y absorción de nutrientes.

Togo Shinohara, MS (Horticultural Sciences, completed, 2008). Development of management practices for artichoke production in southwest Texas.

**Undergraduate students (2007-2012)**

- 2012 Sierra King, Southwest Texas Junior College
- 2012 Sierra Jackson, Southwest Texas Junior College
- 2012 Adelso Contreras, Southwest Texas Junior College.
- 2011 Ezequiel Cardona, Southwest Texas Junior College.
- 2010-11 Diana Garza, Southwest Texas Junior College.
- 2009 Beau Bealmear, Amarillo College, Texas.
- 2009-10 Melina Gonzalez, Southwest Texas Junior College.
- 2009-11 Basilio Quiroga, Southwest Texas Junior College.
- 2009 Manuel Hurtado, Southwest Texas Junior College.
- 2009 Erin Rodriguez Allen, Southwest Texas Junior College.
- 2008 Melissa Clary, Angelo State University.
- 2008 Jose Perez, Southwest Texas Junior College.
- 2008 Gus Flores, Southwest Texas Junior College.
- 2007 Floyd Hood, Southwest Texas Junior College.
- 2007 Raymond Balderas, Southwest Texas Junior College.

**Grants and contracts awarded 2007-2012**

**External Competitive**

- 2008. Leskovar, D.I. Selection of cultivars and management strategies to improve stand establishment, yield, sensory attributes and phenolic compounds in artichoke, a novel crop for Texas. USDA CSREES # 2008, Total $1.3 million $24,000 Uvalde.
USDA CSREES # 2007. $23,520.

**Internal Competitive**

2012. Cabrera, R., Leskovar, D.I., Rodriguez, D., Mills, W., Berry, R., Gabriel, A., Trevino, M. Graywater use and native plant landscaping for urban water conservation. TWRI $100,000.

**External Non-Competitive**

2009. Leskovar, D. Capacitance Probes from Sentek and AquaSpy. Monsanto. $15,000.

**Review panels for grants and journals 2007-2012**

2008 USDA-ARS review panel member National Program 207 ‘Specialty Crops and Organic Systems’
2009 Agriculture and Agri-Food Canada panel member Organic Federation of Canada ‘Integrated Management of Horticultural Crops’
2010 HORT CRSP USAID projects – review panel member, UC Davis CA.

**Editorial boards on which you served 2007-2012**

*Journal of Horticultural Science & Biotechnology.*
*Acta Horticulturae*
*Horticultura Argentina*

**Journals for which you reviewed papers 2007-2012**

*Journal of the American Society for Horticultural Sciences*
*HortScience*
*HortTechnology*
*Journal of Horticultural Science & Biotechnology*
*Scientia Horticulturae*
*Horticultural Reviews*
*Euphytica*
Seed Science and Research
Irrigation Science
Acta Horticulturae
New Zealand Journal of Crop and Horticultural Science
Molecular Breeding
Agricultural Science Research Journal
Horticultural Science

Internal university / agency service on committees 2007 – 2012
2008-2010 Texas AgriLife Research Faculty Fellows Review Panel Member
2009 Texas AgriLife Search Committee Chair, Agronomy
2009 Search Advisory Committee member, Director, Texas AgriLife Research
2009-2011 Texas A&M Agriculture College Peer Review Committee Member
2012-2013 Chair Vegetable and Fruit Industry SWOT Committee
2012 Texas A&M AgriLife Research, Committee co-Chair, Crop Physiology/Agronomy
2012 Texas A&M AgriLife Extension, Committee member, Plant Pathology

Professional association leadership roles 2007-2012
2007 Chair ISHS Working Group on Crop Establishment, Seed and Transplant Technology
2007 Publication committee member – FAV Health International Symposium, Houston, Texas (ISHS)
2009 Member of the Scientific Committee Crop Establishment, Seed and Transplant, Murcia, Spain (ISHS)
2009 Member of the Scientific Committee Artichoke Symposium, Saint Pol de Leon, France (ISHS)
2010 Vice-Chair ISHS Section Vegetables (SEVE)
2012 Member of the Scientific Committee Crop Establishment, Seed and Transplant, Brasilia, Brasil (ISHS)
2012 Member of the Scientific Committee Artichoke Congress, Viterbo, Italy (ISHS)

Awards and recognitions 2007-2012
2007 Vice Chancellor Award in Excellence for Research – Texas A&M System
2008 Texas Commission on Environmental Quality, Agriculture-Team Award
R. Daniel Lineberger
Professor and Head
dan-lineberger@tamu.edu

Program Summary
Application of Computer Technology to Horticultural Teaching and Extension Programs: A teaching and development program designed to integrate web technology into teaching, research, and extension/outreach programs across all horticultural commodities and disciplines. Dr. Lineberger developed the World Wide Web site for the Texas Horticulture Program, Aggie Horticulture (http://aggie-horticulture.tamu.edu/), a gateway to virtual information servers and web-accessible, interactive databases. Upon assuming the duties of Associate Head for Undergraduate Programs in June 1, 2008, Dr. Lineberger relinquished maintenance of the Aggie Horticulture network, but assumed responsibility for the teaching-oriented HortSciences website when it was created to reflect the difference in branding between the College of Agriculture & Life Sciences and the AgriLife Extension Service. Dr. Lineberger was named Head of the Department of Horticultural Sciences effective August 1, 2012.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph. D.</td>
<td>1978</td>
<td>Cornell University</td>
<td>Floriculture and Ornamental Horticulture</td>
</tr>
<tr>
<td>M. S.</td>
<td>1974</td>
<td>Cornell University</td>
<td>Floriculture and Ornamental Horticulture</td>
</tr>
<tr>
<td>B. S.</td>
<td>1971</td>
<td>N. C. State University</td>
<td>Ornamental Horticulture</td>
</tr>
</tbody>
</table>

Professional Experience

2012-present  Professor and Head of Horticultural Sciences - Texas A&M University
2008-2012  Professor and Associate Head for Undergraduate Programs, Department of Horticultural Sciences, Texas A&M University
1994-2008  Professor of Horticultural Sciences, Texas A&M University
1990-1994  Professor and Head of Horticultural Sciences - Texas A&M University
1987-1990  Professor and Head of Horticulture - Clemson University
1982-1987  Associate Professor - The Ohio State University
1977-1982  Assistant Professor - The Ohio State University
1971-1977  Graduate Research Associate - Cornell University

Publications 2007-2012

Referred Publications


Editor reviewed publications or conference proceedings 2007-2012

Electronic media/software (websites, software, videos, etc.) 2007-2012

Department of Horticultural Sciences Website (http://hortsciences.tamu.edu/)
A dichotomous approach to branding the different components of the Texas Agrilife Program rolled out in 2007 dictated that Aggie Horticulture be subdivided into two separate sites, one that displayed the Agrilife template and another that displayed the TAMU (College of Agriculture and Life Sciences) template. Aggie Horticulture has been subsequently maintained by Martin Anderson. I maintain the new site, HortSciences.tamu.edu, as a subdomain on the servers that Martin administers. The HortSciences Website was moved into a Wordpress content management system in 2010 to make it compatible with the College Web system. Marissa Faris assumed maintenance of the departmental Website in March, 2012.

Texas Superstars® Website http://texassuperstars.com/
I maintain the Website for the CEMAP team, a research/extension collaboration whose role is to develop, evaluate and promote new, outstanding ornamental plants for Texas landscapes.

Classes taught (2007-2012)

Undergraduate courses

Horticulture 225, Learning Community for Horticulture. A course taken primarily by students entering the horticulture major. The focus of the course is on helping the students adapt to life at Texas A&M and beginning their exploration of horticulture as a career option. HORT 225 is a writing intensive course. Students also begin the development of their eportfolio as one of the writing assignments. Leo Lombardini began teaching this course in fall, 2012.

Horticulture 481, Seminar. Senior seminar is designed to assist students in the development of documentation of their job readiness, including the creation of a comprehensive resume and eportfolio. Students interview a successful member of the industry who holds a job similar to the one they seek and prepare written and oral reports on the nature of the profession and the professional.

HORT 489. The Floral/Event Design Port folio. This course was developed to teach students to design, create, and maintain an eportfolio Website using modern Web design and content management software. Assignments included digital photography of floral designs and event settings, management of collections of digital images, enhancement of digital images using photo editing software, creation of high quality composite graphics using digital images, formatting images for display on various types of electronic devices, preparing and delivering high quality presentations from various types of electronic devices in and various settings, and leveraging Web-based media for floral design/event management applications.

Horticulture 491, Undergraduate Research. Advise undergraduate students on a research problem, including the design, conduct, analysis and writing phases. Isaac Wong, 2008-09; Kathryn Harvey, 2009; Jake Ueckert, 2010.

Graduate courses

Horticulture 605, Internet Technology for Horticulture. A course designed to teach students how to use the World Wide Web as a source for information, and how to design and operate a server on the Web. Topics include introduction to html, transfer of files via FTP, configuring helper applications, and graphic image acquisition and manipulation. Co-taught in summer 1995 with Laurence Sistrunk, co-taught with Rob Terry in summer 1996, and taught independently since summer 1997. Taught as a Web-assisted course until 2012; likely will be discontinued.

Graduate student committees (non-advises; date is date degree plan was approved)

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Degree</th>
<th>Department</th>
<th>Year</th>
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<tbody>
<tr>
<td>Taylor Paine</td>
<td>MS</td>
<td>Horticultural Sciences</td>
<td>2012</td>
</tr>
<tr>
<td>Ruei-Ping Chang</td>
<td>MS</td>
<td>Agricultural Leadership, Economics, &amp; Communication</td>
<td>2011</td>
</tr>
<tr>
<td>Cody Labus</td>
<td>MS</td>
<td>Animal Science</td>
<td>2011</td>
</tr>
</tbody>
</table>
Crystal A. Dube | MS | Agricultural Leadership, Economics, & Communication | 2011
Kelly M. Pritchett | MS | Agricultural Leadership, Economics, & Communication | 2011
Christopher Shepperd | MS | Agricultural Leadership, Economics, & Communication | 2010
Scott Paul Langley | MS | Animal Science | 2008
Amy Lene McFarland | PhD | Horticultural Sciences | 2008
Tiffany M. Muras | MS | Food Science & Technology | 2008
Sarah Elizabeth West | MS | Animal Science | 2008

Grants and contracts awarded 2007-2012

Aggie Horticulture Behind-the-Scenes-Proof of Concept. 2007. Project funded by HEB to create prototype website with the “look and feel” of HEB.com but pulling educational content from Aggie Horticulture. $5,000 (received $5,000 renewal)

Revision and maintenance of Texas Pierce’s Disease Web Site. 2007. USDA Special Funds through Jim Kamas to create a Website for the Pierce’s Disease program, $10,000

Grant from Neuhaus-Shepardson Teaching Enhancement Program to support the adaptation Information from Aggie Horticulture for use on the iPad. 2010. Amount: $2,000 with $1978 matching from Horticulture Teaching Technology Endowment.

Conversion of Texas Superstar Growers Team Database. 2010. Amount: $9,537 contract from the Texas Department of Agriculture

Principal writer of the departmental Action 2015 high-impact educational practices plan. Funded for 2011-12 for $53,000 with potential for annual renewal; continued in 2012-13 with additional $57,250.

Journals for which you reviewed papers 2007-2012

HortScience
HortTechnology

Internal university / agency service on committees 2007 – 2012

Horticulture Club faculty advisor, 1995-2012
Departmental Scholarship Committee, 1995-Present
College of Agriculture and Life Sciences Undergraduate Program Committee, 2008-Present
Horticultural Sciences Assessment Committee, 2008-Present
Masters of Horticulture Planning Committee, 2009
TAMU Academic Assessment Committee, 2010

Professional association leadership roles 2007-2012

ASHS President, 2001-2002.
ASHS Chairman of the Board, 2002-2003.
Awards and recognitions 2007-2012

2013  NACADA Region 7 Excellence in Advising-Outstanding Advising Award-Faculty
2012  Margaret Annette Peters Advising Award – University Advisors and Counselors
2008  ASHS Distinguished Undergraduate Educator Award
2007  Vice Chancellor’s Award in Excellence for Undergraduate Teaching
2006  Association of Former Students’ Distinguished Achievement Award (College Level)
2006  J. C. Miller, Jr. Distinguished Educator Award, Southern Region American Society for Horticultural Science
2001  Director's Award for Innovative Application of Information Technology in Extension Education (co-recipient with Drs. Parsons, Stein and Wilkerson)
2000  Faculty Achievement Award, TAMU Horticulture Student Council
1997  Fellow, American Society for Horticultural Science
1997  Vice Chancellor's Award in Excellence, Extension Team Category, for the PLANTanswers section of Aggie Horticulture.
1997  Superior Service Award, Team Category, Texas Agricultural Extension Service, for the PLANTanswers section of Aggie Horticulture.
Leonardo Lombardini
Associate Professor
l-lombardini@tamu.edu

Program Summary
Dr. Lombardini holds a two-way split between teaching and research. Current teaching responsibilities include three undergraduate and two graduate courses in the field of international horticulture, tree nut culture, and plant physiology. He has also developed a study abroad course to Italy and helped create opportunities for several students to conduct experiential learning experiences in Central America. He now serves as the chair/co-chair of four Master’s and one Ph.D. student committees and as a member of ten graduate student committees within and outside the Department. Dr. Lombardini’s research focus is plant physiology, especially in relation to gas exchange and environmental stress, with particular emphasis to pecan [Carya illinoinensis (Wangenh.) K. Koch]. In addition, he is investigates the nutritional aspects of pecans and their properties in relationship to human health. Lombardini is also the Job and Internship Coordinator for the Department of Horticultural Sciences.

Academic Background

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<th>Degree</th>
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<tbody>
<tr>
<td>Ph.D.</td>
<td>1999</td>
<td>Michigan State University</td>
<td>Horticulture</td>
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<tr>
<td>Laurea (B.S. + M.S.)</td>
<td>1993</td>
<td>Università di Firenze, Italy</td>
<td>Forestry</td>
</tr>
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</table>

Professional Experience:
2008-present: Associate Professor, Dept. of Horticultural Sciences, Texas A&M University (36% research, 64% teaching)
2002-2008  Assistant Professor, Dept. of Horticultural Sciences, Texas A&M University (36% research, 64% teaching)
1995-1999  Research Assistant, Michigan State University
1994-1995  Research Associate, Università di Pisa, Italy
1993-1994  Research Associate, National Research Council, Italy
1985-1993  Graduate Assistant, Università di Firenze, Italy

Publications 2007-2012

Refereed Publications (underlined names indicate graduate students in the faculty members lab)


Editor reviewed publications or conference proceedings 2007-2012


Popular press articles 2007-2012

Electronic media/software (websites, software, videos, etc.) 2007-2012
Maintain websites for all courses taught, using two different learning management systems, Moodle (https://www-horticulture.tamu.edu/) and TAMU elearning (http://elearning.tamu.edu/).

Books or chapters in books 2007-1012
Patents / plant variety releases / plant variety patents
none

Classes taught (2007-2012) – Undergraduate courses
HORT/ALEC 489 – Agricultural Leaders without Borders. Spring 2012
HORT 225 – Hort Learning Community. Fall 2012.

Graduate courses’

Graduate students (2007-2012)
Advised/co-advised
Cassandra Warren. M.S. student. Project TBD.
Zainab Mansur. M.S. Horticultural Sciences. Quality of Pawnee pecans as influenced by postharvest conditions.
Will Cody. M.S. student. Student transferred to another department.
Ratnaprabha. Ph.D. Project to study the applicability of chemical thinners for crop load manipulation in pecan. Student dismissed for lack of performance after 3 years.
Anais Carrillo. M.S. Cultivating Global Leaders: Enhancing participation in undergraduate experiential learning opportunities for minorities. Student suspended her degree for personal reasons after 1 year.
Madhulika Sagaram. 2007. Ph.D. MEPS. Variation in ecogeographical traits of pecan cultivars and provenances.

First job taken by each of your graduate students 2007-2012
Madhulika Sagaram. Post-doctoral position at the University of Florida, Lake Alfred Research Station.
Ana G. Ortiz-Quezada. Research Associate, Tech de Monterrey, Monterrey, Nuevo Leon, Mexico.

Graduate student committees (non-advises)


**Interdisciplinary program participation (2007-2012)**

Faculty in the Molecular and Environmental Plant Sciences (MEPS)

**Grants and contracts awarded 2007-2012**

- $15,000 Investigating the nutritional properties of pecans. Salopek Foundation. (co-PI: L. Cisneros-Zevallos)
- $15,000 Investigating the nutritional properties of pecans. Texas Pecan Growers Assn. (co-PI: L. Cisneros-Zevallos)
- $15,000 Investigating the nutritional properties of pecans. Texas Pecan Board. (co-PI: L. Cisneros-Zevallos)
- $21,000 Identification, isolation, and quantification of hydrolysable and non-hydrolysable tannins present in different pecan cultivars. USDA – ‘Designing food for health’. (co-PI: L. Cisneros-Zevallos)
- $24,000 Characterization of the human low-density lipoprotein (LDL) oxidation inhibition and antiplatelet aggregation properties of hydrolysable and non-hydrolysable tannins present in kernels and shells of different pecan varieties. USDA – ‘Designing food for health’. (co-PI: L. Cisneros-Zevallos)
- $147,798 Advanced sensing and management technologies to optimize resource use in specialty crops: case studies of water and nitrogen in deciduous crops under control and resource-limited conditions. USDA-CSREES Specialty Crop Research Initiative. (co-PI: A. Volder)
- $137,840 Global leaders in agriculture: enhancing participation in undergraduate experiential learning opportunities for minorities. USDA Higher Education Challenge (HEC) Grant. (co-PI: G. Wingenbach)
- $5,000 Evaluation of ReTain plant growth regulator to increase nut set and fruit retention in pecans. L. Lombardini. Valent BioSciences Corp.
$25,000  Anti-inflammatory effects of pecan extracts and fractions of different pecan cultivars. L. Lombardini. USDA – ‘Designing food for health’. (co-PI: L. Cisneros-Zevallos)

$167,656  Systems approach at improving the long-term competitiveness of U.S. pecans based on their nutritional and health-promoting components. USDA-NIFA. Specialty Crop Research Initiative. (co-Pis: L. Cisneros-Zevallos, Monte Nesbitt)

**Review panels for grants and journals**

**Grant review panel service 2007-2012**

None.

**Journals for which you reviewed papers 2007-2012**

- Acta Horticulturae
- Ethiopian Journal of Applied Sciences and Technology
- HortScience
- Irrigation Science
- Journal of the American Society for Horticultural Sciences
- Scientia Horticulturae

**Internal university / agency service on committees 2007 – 2012**

- TAMU Department of Horticultural Sciences Department Seminar Series Committee. Member, 2003-2010.
- TAMU Department of Horticultural Sciences Undergraduate Program Review Committee. Member, 2003-present.
- TAMU Department of Horticultural Sciences Internship and Job coordinator (see teaching responsibilities). 2003-present.
- TAMU Department of Horticultural Sciences Graduate Degree Program Committee. Member, 2006-2010.
- TAMU Department of Horticultural Sciences Department Scholarship Committee. Member, 2008-present.
- TAMU Department of Horticultural Sciences Graduate Programs Committee. Member, 2008-2010.
- TAMU Department of Horticultural Sciences Assessment Committee. Member, 2009-present.
- TAMU Department of Horticultural Sciences Internationalization of Curriculum Committee. Chair. 2010-2011.
- COALS Agriculture and Natural Resources Policy Internship program Interviewing Committee. Member, 2003-present.
- TAMU Study Abroad Scholarship (SAS) and the International Educational Fee Scholarship – Undergraduate (IEFS-U) Screening Committee. Member, 2004-2008.
- TAMU International Curriculum Development Grant (ICDG)/International Research Travel Assistance Grant (IRTAG) Review Committee, Fall 2007
- Texas AgriLife Research and Extension Center at Uvalde Resident Director Search Committee. 2011

**Professional association leadership roles 2007-2012**

- *American Society for Horticultural Science (ASHS).* Served as judge for undergraduate poster competition at the 2008 and 2009 Conferences.
- *International Society for Horticultural Science (ISHS).* Currently Co-Convener of the I International Symposium on Pecans and Other *Carya* in Indigenous and Managed Systems, to be held at College Station, July 2013.

**Awards and recognitions 2007-2012**


First place at the 2009 VFIC Conference “Consumers to Farm: Changing Patterns in the Fruit and Vegetable Industry” Austin, TX, Aug. 21, 2009 with the paper Ortiz-Quezada A.G. (presenter and award recipient), L. Lombardini, and L. Cisneros-Zevallos. Identification of tannins from pecan kernels by liquid chromatography-mass spectrometry.

Session winner by College (College of Agriculture and Life Sciences) at the 12th Annual Student Research Week. Texas A&M University, Mar. 23-27, 2009 with the paper Ortiz-Quezada A.G. (presenter and award recipient), L. Lombardini, and L. Cisneros-Zevallos. Identification of tannins from pecan kernels by liquid chromatography-mass spectrometry.
Second place Taxonomy Winner by College (College of Agriculture and Life Sciences) at the 12th Annual Student Research Week. Texas A&M University, Mar. 23-27, 2009 with the paper Ortiz-Quezada A.G. (presenter and award recipient), L. Lombardini, and L. Cisneros-Zevallos. Identification of tannins from pecan kernels by liquid chromatography-mass spectrometry.
William J McKinley, Jr.
Senior Lecturer and Director/Endowed Chair Benz School of Floral Design
wjmckinley@tamu.edu

Program Summary
Mr. McKinley’s position is multi-faceted; teaching for the Department of Horticulture, administering the Benz School of Floral Design classes and programs, and the Benz Gallery of Floral Art. Teaching responsibilities include four senior level undergraduate courses in floral design/floral art as well as the continuing education classes for the Benz School. He also serves as the faculty advisor for the Student Floral Design Club (SAIFD).

Responsibilities of director of The Benz School of Floral Design include managing the Benz Endowed Chair, maintaining the atrium and scheduling art exhibitions in the Benz Gallery of Floral Design, manage the curriculum and certification of Benz School – Korea program, teaching two week (as well as two-day) industry short courses, and liaison with garden clubs and other industry organizations.

The Benz School is considered one of the finest short courses available in the floral design field, both in the United States and internationally. It is the only professional floristry school associated directly with an institution of higher education and it is academically recognized by the Southern Association of Colleges and Universities, the same agency that accredits Texas A&M University. The Benz School also contains the only endowed chair in floral design in the world. The curriculum for the Benz School is basic in concept and there are no prerequisites for enrolling. Students in the Benz School may receive Continuing Education Units (CEU) if desired.

Academic Background

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<tr>
<th>Degree</th>
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<th>Institution</th>
<th>Major</th>
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<tbody>
<tr>
<td>BS</td>
<td>1981</td>
<td>University of Missouri, Columbia</td>
<td>Horticulture</td>
</tr>
<tr>
<td>MAg</td>
<td>1983</td>
<td>Texas A&amp;M University</td>
<td>Floriculture</td>
</tr>
</tbody>
</table>

Professional Experience:
July 2011 to present Senior Lecturer, Dept of Horticultural Sciences and Endowed Chair/Director Benz School of Floral Design, Texas A&M University

January 1997 to present Contributing Editor for FLOWERS & Magazine, Teleflora, Inc, Los Angeles, CA

July 2005 to July 2011 Associate Dean, Career Technologies Division, Kishwaukee College, Malta, IL

Publications 2007-2012

Popular press articles 2007-2012
Monthly column in Flowers & Magazine (72 articles) published by Teleflora, Inc., Los Angeles, CA

Electronic media/software (websites, software, videos, etc.)
2007-2012 Online Administrator for AIFD’s Online Education Courses (Blackboard, then conversion to Moodle)
2009-present Online Instructor Workshops for AIFD, |
2009- present Coordinated and directed AIFD’s third video series on the topic of “Evaluation of Designs,” 2001-12 (also coordinated/directed/edited previous two video series in 2009 and 2010)

Books or chapters in books 2007-1012

Books

Classes taught (2007-2012)

Undergraduate courses
Horticulture 451 Retail Floristry Fall 2011 (two sections), Fall 2012 (two sections)
Horticulture 452 Weddings and Personal Flowers ,Spring 2012 (two sections)
Horticulture 453 Floral Art, Fall 2011
Horticulture 454 Special Event Design and Production, Fall 2011 (two sections) Spring 2012 (two sections)
Horticulture 485 Directed Studies, Fall 2011 (one student), Spring 2012 (two students), Fall 2012 (one student)

Graduate courses
NA

Graduate students (2007-2012)
Advised/co-advised
Cole Etherige, new PhD student fall 2012

First job taken by each of your graduate students 2007-2012
NA

Graduate student committees (non-advisees)
NA

Interdisciplinary program participation (2007-2012)
NA

Grants and contracts awarded 2007-2012
Summer 2012 - Benz Online Project, Entrepreneurial Grant from Exe. Associate Dean Dr. Alan Sams, $83,000, repayment of used portion beginning Spring 2014.

Fall 2012 - Integration of Online/Hybrid Instruction into Hort 203, Distance Education Grant, $35,000, course to be first taught Spring 2014.

Review panels for grants and journals
Grant review panel service 2007-2012
NA

Editorial boards on which you served 2007-2012
NA

Journals for which you reviewed papers 2007-2012
HortTechnology

Internal university / agency service on committees 2007 – 2012
Horticulture Curriculum Committee
Scholarship Committee
Force
Special Events Certificate Advisory Committee

Professional association leadership roles 2007-2012
American Institute of Floral Designers (AIFD) – National Board of Directors 2009 - present, National Certification Committee Chair & Liaison 2007 - present, National Education Committee 2010 - present, Online Education Administrator 2009- present
Texas State Florists’ Association (TSFA) – Technology Committee 2011 - present, Education Committee 2012
Prior to July 2011, member of Illinois State Florist Association, Certification Committee, Lead Certification Instructor, Board of Directors, Hall of Fame Inductee

Awards and recognitions 2007-2012
American Institute of Floral Designers Distinguished Service to the Floral Industry Award (2010)
Illinois State Florists’ Association Hall of Fame Award (2009)
Julian Creighton Miller, Jr.
Professor of Horticulture, and of Genetics, and of Biotechnology
jcmillerjr@tamu.edu

Program Summary
Dr. Miller is Professor of Horticulture at Texas A&M University, College Station. He is Director of the Texas Potato and Legume Improvement Program, and has developed or co-developed 24 new potato and legume varieties. Three of his potato varieties collectively rank fourth in US seed approved for certification. His varieties have earned some three million dollars in royalties for the Texas A&M University System. He has authored/co-authored more than 300 scientific/technical publications. Dr. Miller has taught six different undergraduate and graduate courses and continues to teach HORT 101 each semester. Dr. Miller has served as major professor for 21 MS and 16 PhD students. He was the 1992 recipient of the prestigious L.M. Ware Distinguished Teaching Award from the Southern Region American Society for Horticultural Science. In 2005, he received the Distinguished Achievement Award in Teaching from the Association of Former Students of Texas A&M University. He is a Past President of the American Society for Horticultural Science – Southern Region and of The Potato Association of America, and an Honorary Life Member (Fellow) of the latter organization. He is also a Fellow of the American Society for Horticultural Science and former Vice-President for Research. He is the 2009 recipient of the Outstanding Researcher Award presented by the American Society for Horticultural Science. He was co-recipient of the Vice Chancellor's Award in Excellence for Partnership Collaboration, 2013. Dr. Miller retired in 2007 but has been re-employed half-time since, and continues to travel more than 80 days per year in association with the breeding programs.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>1972</td>
<td>Michigan State University</td>
<td>Horticulture (Plant Breeding)</td>
</tr>
<tr>
<td>M.S.</td>
<td>1967</td>
<td>Louisiana State University</td>
<td>Horticulture</td>
</tr>
<tr>
<td>B.S.</td>
<td>1965</td>
<td>Louisiana State University</td>
<td>General Studies</td>
</tr>
</tbody>
</table>

Professional Experience:
2010 – present  Graduate Faculty of Biotechnology
1984 - 2008  Graduate Faculty of Molecular and Environmental Plant Sciences
1982 – present  Professor, Texas A&M University
1981 – present  Graduate Faculty of Genetics
1980-1983  Interim Head, Horticultural Sciences Department, and Director of the Montague Fruit Research Station, Texas A&M University
1977-1982  Associate Professor, Texas A&M University
1975-1977  Assistant Professor, Texas A&M University
1972-1975  Assistant Professor, Texas Agricultural Experiment Station, Lubbock
1968-1972  Research Assistant, Michigan State University
1967-1968  Research Assistant, University of Wisconsin
1965-1967  Research Assistant, Louisiana State University

Publications 2007-2012
Refereed Publications (underlined names indicate graduate students in the faculty members lab)
deBona, C.M., D.C. deCarvalho, D.M. Stelly, J.C. Miller, Jr., and E.S. Louzada. 2011. Symmetric and asymmetric somatic


Texas AgriLIFE Research, College Station and Lubbock. 22p.


**Editor reviewed publications or conference proceedings 2007-2012**


**Popular Articles 2007-2012**

Invited Speaker 2007-2012
Speaker at the Citrus Huanglongbing (HLB) and Potato Zebra Chip (ZC) Conference, McAllen, TX, November 16-18, 2009. (Identification/Development of ZC Tolerant/Resistant Cultivars).
Speaker at the Potato Zebra Chip (ZC) Conference, Dallas, TX, December 4, 2008. (Identification/Development of ZC Resistant/Tolerant Cultivars).
Invited Speaker at the West Texas Vegetable Conference, Canyon, Texas, January 16, 2007. (Using Line Selection to Improve Russet Norkotah Strains).

Websites 2007-2012

Books or chapters in books 2007-1012

Referred variety release articles 2007-2012

Patents / plant variety releases / plant variety patents
'Norgold Russet Strain M' potato in collaboration with Gene Shaver and Warren Trank, Nebraska, 1974.
'Krantz' potato cultivar, with the Minnesota Agricultural Experiment Station, 1985.
'TexSprout' mungbean, with the Asian Vegetable Research and Development Center, 1988.
'Russet Nugget' potato cultivar, with the Colorado Agricultural Experiment Station, 1988.
'Texas Pinkeye' cowpea cultivar (PVP# 910008), 1990.
‘Century Russet’ potato cultivar with the Colorado, California, Oregon, and Washington Agricultural Experiment Stations, 1996.
Russet Norkotah Strains 112 (PVP#9900141), 223 (PVP#9900140), and 278 (PVP#9900139), 1999.
‘AC Stampede Russet’ potato cultivar Agriculture and Agri-Food Canada, (PVP#200500177), 2005.
‘TX1523-1Ru/Y’ (Sierra Gold) potato cultivar (PVP#200200202), 2002.
Russet Norkotah Strain 296 (PVP#200300288), 2004.
‘TX1523-1Ru/Y’ (Sierra Gold) potato cultivar (Canada Plant Breeder’s Rights, Certificate No.: 2093), 2005.
‘Rio Rojo’ potato cultivar (PVP#200600098), 2006.
‘ATTX961014-1R/Y’ (Sierra Rose) potato cultivar (PVP#201200166), 2012.
Classes taught

Undergraduate courses
Genetics 485, Directed Studies: Fall, Spring, Summer 1981-
Horticulture 101 Concepts of Horticultural Science: Fall, Spring 1983 –
Horticulture 291, Research Credit: Fall, Spring, Summer 2008 –
Horticulture 485, Directed Studies: Fall, Spring, Summer 1975 –

Horticulture 491, Research Credit: Fall, Spring, Summer 2008 –

Graduate courses
Genetics 685, Directed Studies: Fall, Spring, Summer 1981 -
Genetics 691, Research Credit: Fall, Spring, Summer 1981 -
Horticulture 685, Directed Studies: Fall, Spring, Summer 1976 -
Horticulture 690, Theory of Research: Fall, Spring, Summer 1978 -
Horticulture 691, Research Credit: Fall, Spring, Summer 1978 -

Graduate students (2007-2012)
Advised/co-advised


First job taken by each of your graduate students 2007-2012
Claudine Maria De Bona – Research Scientist, Instiuto Agronomico do Parana, Brazil
Lavanya Reddivari – Assistant Professor, Colorado State University
Magnifique Ndambe Nzaramba – Deputy Director General, Export Operations & Market Development, National Agriculture Export Development Board, Rwanda
Sarah Diane Turner – Graduate Research Assistant (PhD), University of Wisconsin-Madison

Graduate student committees (non-advises)
About 12 since 2007

Interdisciplinary program participation (2007-2012)
Graduate Faculty of Genetics, 1981-
Graduate Faculty of Molecular and Environmental Plant Sciences, 1984 - 2008
Graduate Faculty of Biotechnology, 2010-

Grants and contracts awarded 2007-2012
$10,000. USPB Grant for National Chip Breeders Trial – Texas. 2012.

$56,000. USDA National Institute of Food and Agriculture. Special Research Grants Program, Potato Research. Potato Breeding and Cultivar Development in the Southwest. 2012. (With Colorado State University and University of California - total - $168,000) (no indirect costs permitted).


$10,000. USPB Grant for National Chip Breeders Trial – Texas. 2010.


$3,000. USDA/ARS Special Grant. Evaluating soybean rust migration on alternate hosts – Cowpea. 2009.


$3,000. USDA/ARS Special Grant. Evaluating soybean rust migration on alternate hosts – Cowpea. 2008.

$34,750. USDA/ARS-State Partnership Potato Program. Maximizing the nutritional value/health benefits of potato by metabolic profiling and identification of compounds with anticancer properties. 2008. (With Roy Navarre, Vegetable and Forage Crops Research Laboratory, Prosser, WA. Total - $75,000).


$3,000. USDA/ARS Special Grant. Evaluating soybean rust migration on alternate hosts – Cowpea. 2007.


$35,685. USDA Cooperative State Research, Education, and Extension Service. Special Research Grants Program, Potato Research. Potato Breeding and Cultivar Development in the Southwest. 2007. (With Colorado State University and University of California) (no indirect costs permitted). NOTE – This was funded through Hatch Funds from the TAES allocation.


Review panels for grants and journals

Journals for which you reviewed papers 2007-2012

American Journal of Potato Research

HortScience

Journal for the American Society for Horticultural Sciences

Internal university / agency service on committees 2007 – 2012

Faculty Awards Committee, 1983-; Chair, 1992-2007
Promotion and Tenure Committee, 1982-
  Organized, appointed and served on first P&T Committee
Hisashi Koiwa Tenure Mentoring Committee, 2004-07
Scholarship Committee, 1988-
Served as judge for Texas 4-H Round Up – Horticulture Demonstration Contests 2010 and 2011

Professional association membership and leadership roles 2007-2012

Southern Association of Agricultural Scientists
  American Society for Horticultural Science, Southern Region
  Krezdorn Award Committee, 2008-2013.

American Society for Horticultural Science
  Vegetable Breeding Working Group, 1978-
  Genetics and Germplasm Working Group, 1979-
  Vegetable Crop Management Working Group, 1980-
  Food Quality and Nutrition Working Group, 1996-
  Plant Biotechnology Working Group, 1985-

Crop Science Society of America
  C-8 Div. Plant Genetic Resources Committee, 1992-

American Society of Agronomy

The American Genetic Association
Botanical Society of America, Genetics Section  
American Association for the Advancement of Science  
European Association for Potato Research  
The Potato Association of America  
Pathology Section, 1975-  
Breeding and Genetics Section, 1978-  
Physiology Section, 1981-  
Membership Committee, 1988-  
Production/Management Section, 1991-  
PAA Endowment Fund Committee 1999-, Chair, 2001-07  

(NRSP-6): InterRegional Potato Introduction Project, State Agricultural Experiment Station Representative, Southern Region, 1988-2012  
Chair, 2006-07  
Secretary, 2009-10  
Vice-chair, 2010-11  
Chair, 2011-12  

Potato Crop Germplasm Committee, 1988-  
National Cowpea Improvement Association, founder, 1980-  
Western Regional Potato Variety Development Coordinating Committee (WERA-27), 1988-  

Vigna Crop Germplasm Committee, USDA, 1984-  
National Potato Council, 2000-  

Awards and recognitions  
American Society for Horticultural Science, Fellow, 1987  
American Society for Horticultural Science, Vegetable Publication Award for 1987 (co-recipient)  
Southern Region, American Society for Horticultural Science, President Elect, 1991; President, 1992  
Research Division, American Society for Horticultural Science, Vice President Elect, 1993-94  
Research Division, American Society for Horticultural Science, Vice President, 1994-95  

Potato Association of America, Vice President, 1996-97  
Potato Association of America, President Elect, 1997-98  
Potato Association of America, President, 1998-99  

Horticulture Graduate Council, Faculty Distinguished Service Award, 1997  
Southern Region, American Society for Horticultural Science, L.M. Ware Distinguished Teaching Award, 2002  
Honorary Life Member, Potato Association of America, 2003  
Association of Former Students Distinguished Teaching Award 2005  
Outstanding Researcher Award, 2009, American Society for Horticultural Science  
Co-recipient of the Vice Chancellor's Award in Excellence for Partnership Collaboration, 2013
Dr. Genhua Niu, Associate Professor
Environmental Horticulture and Urban Landscape Water Conservation
Texas A&M AgriLife Research and Extension Center at El Paso
Texas A&M University System
1380 A&M Circle, El Paso, TX 79927
Email: gniu@ag.tamu.edu

Program Summary
Dr. Genhua Niu is an off campus faculty located at the Texas A&M AgriLife Research Center at El Paso with 100% Research Appointment. Her areas of special expertise are in environmental stress physiology and plant production in controlled environment. Her current research areas include identifying drought and salt tolerant low water use plant materials for urban landscape, quantifying growth and physiological responses of crops to drought, salt and heat stresses, and determining the minimum water requirement for urban landscape plants for maintaining a healthy landscape while conserving water. In addition, Dr. Niu is also working on evaluating the salt and drought tolerance of a range of bioenergy crops and vegetables for the semi-arid region. As a researcher at an off campus research center, Dr. Niu closely works with county extension agents on local extension programs. She also collaborates with faculty members at the Department and other research centers on research programs and graduate students education by co-advising and serving as a graduate committee member. In professional society service, Dr. Niu has been active by serving as officers of several working groups for American Society for Horticultural Science and USDA regional meetings.

Academic Background

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<tr>
<td>Ph.D.</td>
<td>1997</td>
<td>Chiba University, Japan</td>
<td>Horticulture</td>
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<tr>
<td>M.S.</td>
<td>1987</td>
<td>Zhejiang University, China</td>
<td>Agricultural Engineering</td>
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<td>B.S.</td>
<td>1984</td>
<td>Zhejiang University, China</td>
<td>Agricultural Engineering</td>
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Professional Experience
2010 – Present    Associate Professor, Texas A&M AgriLife Research Center at El Paso, Texas A&M University System
2004 – 2010       Assistant Professor, Texas A&M AgriLife Research Center at El Paso, Texas A&M University System
2009 – Present    Adjunct professor, Texas Tech University
2006 – Present    Adjunct professor, New Mexico State University
2003 – 2004       Visiting scientist, USDA-ARS, Beltsville, MD
2001 – 2003       Research Director, Southern Sun Biosystems, Inc., SC
1998 – 2001       Research Associate, Michigan State University
1997 – 1998       Post-doctoral Fellow, Chiba University, Japan

Publications 2007-2012
Refereed Publications
Editor reviewed publications or conference proceedings 2007-2012


Popular press articles 2007-2012


**Book Chapter 2007 -2012**


**Grants and contracts awarded 2007 – 2012**

- $176,538 Impact and social acceptance of selected sustainable practices in ornamental crop production systems. USDA-NIFA SCRI, 2010 -2014.
- $20,000 Determining salinity and drought tolerance of selected landscape plants, Urban landscape water conservation, Task 5, Rio Grande Basin Initiative, PI, USDA-CSREES through TWRI, 2009-2010.
- $6,500 Plant Growth Regulator Impact on Greenhouse or Perennial Herbaceous Ornamental Plant Branching, IR-4 project, 2011.
- $6,000 Augeo Impact on Branching of Hydrangea, IR-4 project, 2012.
- $16,033 Membrane treatment of impaired irrigation return and other flows for creating new sources of high quality water, American Water Works Association Research Foundation, USBR, SCERP, EPWU, 2007.

**Journals for which you reviewed papers 2007 – 2012**

- Bioresource Technology
- Biosystem Engineering
- Canadian Journal of Plant Science
- Computers and Electronics in Agriculture
- European Food Research and Technology
- HortScience
- HortTechnology
- Food Research International
- International Journal of Plant Science
- Journal of American Society for Horticultural Science
- PLOS ONE
- Scientia Horticulturae
- Transaction of the ASAE

**Review panels for grants and proposals**

- CRDF (Civilian Research Development Foundation)
Graduate students (advised/co-advised) 2007-2012

- Xiaoya (Amy) Cai, Ph.D. candidate, co-advisor, (September 2010 to present)

Graduate student Committee 2007-2012

- Evan Call, MS candidate, graduated in 2011, New Mexico State University.
- Min Lin, Master candidate, graduated in 2011, Department of Horticultural Sciences, Texas A&M University.
- Nicholas Thomas Adams, Department of Environmental Science, New Mexico State University, MS student, graduated in 2011.

Visiting Scholar advised 2007-2012

- Pedro Osuna, visiting scientist, Universidad Autonoma de Cd. Juarez; Chihuahua, Mexico (June 2011- December 2012)
- Minzi Wang, Central South University of Forestry & Technology, China, June to December 2009

EPCC Research Initiative Science Enhancement (RISE) students advised 2007-2012:

2. Rosie Cabrera, Biology, EPCC RISE student (2007-2008)
3. Erik Acosta, EPCC RISE student (March 2009 – August 2011)
4. Denice Manriquez, EPCC RISE student (April 2010 – present)
5. Mike Mendoza, Biology, EPCC RISE student (August 2010 – present)
6. Christina Perez, Biology, EPCC RISE student (August 2012 – present)

Undergraduate students advised 2007-2012

1. Kristian Ortiz, UTEP Work Study student, February 2006 – August 2007
4. Margarita Thornton, Technician II (June to August 2008)
5. Crystal Salcido, Student worker (May to October 2008)
6. Cindy Valdes, EPCC RISE Student (October 2007 to December 2008)
7. Rosie Cabrera, EPCC RISE Student (October 2007 to August 2008)
8. Rosie Cabrera, AgriLife student worker (September 2008 to May 2009)
9. Jose Gonzalez, UTEP work study student (September 2008 to August 2011)
10. Stephanie Murr, EPCC Student Worker (October to December 2008)
11. Anna M. Brew, EPCC RISE student (October 2008 to May 2009)
12. Erik Acosta, EPCC RISE Student (March 2009 to present)
13. Stephanie Renteria, UTEP work study student (February 2009 to May 2009)
14. Jacqueline A. Parisi, AgriLife Student worker (May to August 2009)
15. Gabriel Moreno, UTEP work study student (Sept 2009 to present)
17. Alan Lara, AgriLife student worker (April 2010 to August 2010)
18. Liz Rodriguez, Student worker, UTEP, (October 2010 to December 2011)
19. Denice Manriquez, Salt tolerance of wilder flowers (April 2010 to present)
20. Mike Mendoza, biology, EPCC RISE student (August 2010 to present)
21. Melissa Godina, UTEP work study student (Sept 2011-present)
22. Samuel Retana, UTEP Work study student (Sept 2012 – present)

Professional Activities

  o Secretary (2012/2013) for Environmental Stress Physiology
  o Outstanding Research Award Committee 2010-2012
  o Outstanding Graduate Award Committee 2012-2014
  o Secretary, Chair-elect, Chair for Asian Horticulture Working Group (2008-2010)
  o Secretary, Chair-elect, Chair for Nursery Crops working group (2005-2007)
• Regional Group NC1186 – “Water Management and Quality for Ornamental Crop Production and Health” North Central Association Multistate Research Project.
  o Secretary – 2012-2014
• Regional Group WERA 1013 “Intermountain Regional Evaluation and Introduction of Native Plants”
  o Secretary – 2012-2014

Professional Recognition:

• Bridget Fellow of Japan Society for Promotion of Science, 2010. Host: Chiba University from Nov 6 to Dec 11, 2010.
• USDA CSREES National Water Program Award for Outstanding Integrated Activities for Water Resources, Rio Grande Basin Initiative Team Member, 2007. First USDA national teamwork award for integrated water resources, ranked number 1 out of 37 nominations.
Bhimanagouda Patil
Director of the Vegetable and Fruit Improvement Center and
Professor in the Department of Horticultural Sciences
b-patil@tamu.edu

Program Summary
Dr. Patil balances his efforts among teaching, research and administration. For teaching, Patil has provided undergraduate students with opportunities for experiential learning, enhancing faculty preparation for multidisciplinary courses, instructional delivery and developing a comprehensive curriculum through USDA-Challenge grants. Patil collaboratively developed two first-of-a-kind courses, ‘Science of Foods for Health’, and ‘Phytochemicals in Fruits and Vegetables to Improve Human Health’, by conducting a curriculum development workshop with multidisciplinary faculty from three U.S. land grant universities. These unique courses benefitted not only TAMU students but also three land grant universities and five other universities in Texas. The enrollment in both courses has been increasing and similar numbers of students enrolled in other states; we continue to receive requests from other land grant universities to expand these courses to their schools. Since 2007, Dr. Patil has also served as the chair/co-chair on 14 Ph.D. and 5 M.S student committees and as a member of four graduate student committees. He initiated several new and cutting-edge collaborative research projects, related to processing and pre-and postharvest effects on bioactive compounds. Additionally, the research focus of Dr. Patil's lab has expanded to include isolation and characterization of bioactive compounds to determine their potential human health benefits. Further testing of these bioactive compounds is being conducted in cell and animal studies, and recently even human intervention studies, to understand their mechanisms of action. Specialty crops are also under investigation to understand their health-maintaining properties. By expanding the research focus of the VFIC to include examination of human health benefits, this new research direction has synergistically supported traditional breeding efforts, yielding a stronger, diverse research program. He also collaborated with multidisciplinary faculty, staff and students to develop and implement new strategic plans to increase VFIC resources, increase the numbers and diversity of undergraduate and graduate students and faculty, and improve programmatic relevance and excellence. He has published a substantial number of scientific papers in peer-reviewed journals, editor reviewed proceedings, book chapters, and edited books. Dr. Patil served as an International Advisory Board Member in 9 professional societies and four industry-related boards.

Academic Background

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<tr>
<td>Ph.D.</td>
<td>1994</td>
<td>Texas A&amp;M University</td>
<td>Horticulture</td>
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<tr>
<td>M.S.</td>
<td>1987</td>
<td>University of Agricultural Sciences</td>
<td>Horticulture</td>
</tr>
<tr>
<td>B.S.</td>
<td>1984</td>
<td>University of Agricultural Science</td>
<td>Agriculture</td>
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</table>

Professional Experience:
2005-present Director Vegetable & Fruit Improvement Center, Texas A&M University
2008-present Professor, Dept. Horticultural Sciences, Texas A&M University
(25% teaching, 25% research, 50% administration)
2005-2008 Associate Professor, Dept. Horticultural Sciences, Texas A&M University
(35% teaching, 65% administration and research)
2002-2004 Associate Director, Vegetable & Fruit Improvement Center, Texas A&M University
1997-2004 Assistant Professor of Plant Physiology, Texas A&M University – Kingsville Citrus Center
1996-1997 Post-Doctoral Research Associate, University of California – Kearney Agricultural Center
1994-1996 Post-Doctoral Research Associate, Washington State University, Prosser
1989-1991 Instructor, University of Agricultural Sciences, Dharwad

Publications 2007-2012

Refereed Publications (underlined names indicate graduate student/post doc in the faculty member’s lab)


Editor reviewed publications or conference proceedings 2007-2012


Popular press articles 2007-2012

Healthy vegetable, fruit research draws students to agricultural studies that pay off. AgriLife Today- Kathleen Phillips-March 8, 2012.


Texas AgriLife Researchers making better melons. AgriLife Today- Paul Schattenberg-September 2011.


Students study science of foods for health. Samantha Smith- January 22, 2010- http://ccts.osu.edu/news-highlight/students-study-science-healthy-food


Electronic media/software (websites, software, videos, etc.) 2007-2012

Maintain the center website, two class websites, and three Facebook discussion groups for the classes:

- Vegetable & Fruit Improvement Center http://vfic.tamu.edu/
- HORT 640 http://agrilife.org/phytochemicals/
- HORT 640 https://www.facebook.com/phytochemicals.vfic
- HORT 689 http://agrilife.org/foodsforhealth/
- HORT 689 http://www.facebook.com/groups/320710744645926/

Editor-Books/Symposium Series 2007-1012

Editor


Chapters:


Patents / plant variety releases / plant variety patents


Classes taught (2007-2012)

Horticulture 640 (Initially taught as Horticulture 689), Phytochemicals in Fruits and Vegetables to Improve Human Health: Fall 2007, 2010 and 2011. This course is also offered to students at Ohio State University and Colorado State University. This is funded by the USDA-Challenge grant to develop a multi-disciplinary course.
Horticulture 489, Science of Foods for Health: Fall 2009. This course also offered to students at Iowa State and Ohio State University. This is funded by the USDA-Challenge grant 2006-38411-17095 to develop a multi-disciplinary course.

Horticulture 689, Science of Foods for Health: Fall 2012. This course also offered to students at Iowa State and Ohio State University.

Horticulture 691, Research, each semester from Fall 2007 through Fall 2012 at Texas A&M University and on average more than six students registered.

**Graduate students (2007-2012)**

**Advised/co-advised**


Jaiprakash Patil. 2009. Ph.D. Isolation and characterization of Bio active compounds in Lime and also study their potential in prevention of cancer by cell culture studies (Graduated at University of Agricultural Sciences, Dharwad).


Amit Vikram. 2011. Ph.D. Isolation and Purification of Citrus Bioactive Compounds and Elucidation of their Anti-quorum sensing and Biofilm Inhibition properties


Rammohan Uckoo. 2012. Ph.D. Production systems and processing effect on phytochemicals in citrus fruits and their analytical and isolation methods.


Shinsuke Agehara. Current Ph.D. Student. Investigating effects abscisic acid function in vegetable transplants and its applications to extend marketing period and improve desiccation tolerance.


Akshata Kulkarni. Current M.S. Student.

**First job taken by each of your graduate students 2007-2012**

Basavaraj Girennavar – CEO, Rico Wines, India; CEO, Criyagen Agri and Biotech Ltd

Alavaro Proano -

Togo Shinohara - Research Scientist, Japanese International Research Center for Agricultural Sciences

Jose Perez – Chemist, USDA ARS

Jaiprakash Patil – Associate Professor, University of Agricultural Sciences, Raichur, India

Madhurababu Kunta – Scientist, Texas A&M University- Kingsville Citrus Center.

Jin Hee Kim – Research Professor, Sahmyook University, South Korea

Justin Butcher – Vegetable Breeder, Emerald Seed Co.

Hae Jeen Bae – Postdoctoral Research Associate, National Institute of Horticultural and Herbal Science, South Korea

Amit Vikram – Postdoctoral Research Associate, Dept. Microbiology and Molecular Genetics, School of Medicine, University of Pittsburgh

Ren Yan – Scientist, Phillips Research

Murli Manohar – Postdoctoral Fellow, Boyce Thompson Institute, Cornell University

Rammohan Uckoo – Postdoctoral Research Associate, Texas A&M AgriLife Research

Kranthi Chebrolu – Department of Horticultural Sciences, Texas A&M University
Graduate student committees (non-advisees)
Sean Thompson. 2010. M.S. Dept. of Molecular & Environmental Sciences. Understanding Calcium Partitioning by Expression of Membrane Transport and Binding Proteins in Tobacco and Carrots

Interdisciplinary program participation (2007-2012)
Molecular & Environmental Plant Sciences
Faculty of Nutrition

Grants and contracts awarded 2007-2012

**Special grants are allocated to approximately 23 scientists based on their competitive research focused on foods for health and the lead PI is responsible for writing proposal and project management.
***Total amount (Patil).

Review panels for grants and journals
Grant review panel service 2007-2012
Invited by the USDA-CSREES as Ad hoc Reviewer- USDA-ARS NP306 Quality- December 2011.
Invited by the USDA-CSREES as Ad hoc Reviewer- USDA-ARS NP306 Quality- August 2011
USDA-CSREES as Peer Panel Member- USDA-ARS NP306 Quality- April 21-24, 2010
Invited by the USDA-CSREES as Ad hoc Reviewer- USDA-ARS NP306 Quality- August 2010
Invited by the USDA-CSREES as Peer Review Panel Member to evaluate the proposals- Washington, D.C. April 2007 and April 2008.

Editorial boards on which you served 2007-2012
Editor-Acta Horticulturae 841
Editor-American Chemical Society Symposium Series-1093
Journals for which you reviewed papers 2007-2012
Journal of the Science of Food and Agriculture
Food Chemistry
Journal of Food Science and Technology
Journal of Agriculture and Food Chemistry
Life Sciences
HortScience
Expert reviewer for Sunkist Citrus Nutrition Platform
Book chapter- American Chemical Society

Internal university/agency service on committees 2007 – 2012
Elected member, Council of Principal Investigator, Texas A&M University-2010-present
Member, Council on Built Environment, Texas A&M University-2012-present
Member- Vice Chancellor’s Agriculture Faculty Advisory Committee, TAMU, College Station, TX 2007-2008.
TAMU Department of Horticultural Sciences, Graduate Faculty, College Station, TX 2007-2012
TAMU Molecular and Environmental Plant Sciences, Program, Texas A&M University, College Station, TX
TAMUK Department of Agronomy and Resource Sciences, Adjunct Graduate Faculty, Kingsville, TX 2007-2012
TAMU Department of Nutrition, Member Faculty of Nutrition, College Station, TX 2007-2012
Program Director and Convener for the Workshop on curriculum development for developing a course “The Science of Foods for Health,” 2007
TAMU coordinator for the US-India Knowledge Based Initiative on Agricultural Research and education, 2007-2012

Leadership role in Service activities to industry
Advisory Board:
- Florida Department of Citrus Health and Wellness Advisory-2011
- Texas Vegetable Association: 2010- until now
- Tropicana Nutrition Advisory:2008- until now
- Sunkist Nutrition Group-Advisory 2009

Co-chair, Goal-3 and member of steering committee-National Vegetable Research Initiative-This is a national level industry-academic effort.

Professional association leadership roles 2007-2012
Served as a committee member of the American Society for Horticultural Sciences,
- Publications Committee 2002-2007
- International Advisory Committee 2002-2012
- Citrus Committee 2007-2012
- Teaching Methods Committee 2007-2012
- Postharvest Committee 2007-2012
- Produce Quality and Safety and Health Properties 2007-2012
- Tropical Horticulture 2012

Leadership Role in Professional Societies
American Society for Horticultural Science
Fellow, American Society for Horticultural Sciences-2009
Chair-Tropical Horticulture (TROP) working Group (2001-02; 2005-06; 2008-2011)
Chair-International Topics of Concern (ITCH) working group-1999-00
Founding Chair- Association of Horticulturists of Indian Origin (AHIO)-2005-07

International Society for Horticultural Science
Vice Chair, Commission Fruits and Vegetables and Health (2011-present)
International Advisory Scientific Committee member- First workshop “Networking the FAV and Health Networks”-28th ISHS Congress, Lisbon, Portugal-2010.
Chair- Symposium on “Human Health Benefits of Citrus”- 9th International Citrus Congress-2000, Orlando, FL.
FAV symposium series. Yves Dejardins and Patil established an international symposium on Human Health Effects of Fruits and Vegetables (FAV Health) in 2005. As a Chair of the second international symposium on FAV Health 2007, which was hosted by the VFIC in Houston and sponsored by the ASHS and ISHS. Number of participants increased to 300 from 38 countries. FAV Health continues to succeed; symposia were held in 2009 (France), 2012 (India) and are scheduled be hosted in 2014 (Australia) and 2016 (Brazil).

Chaired FAV Health 2007 and the number of countries participated in 2007 was almost double the number attending FAV health 2005 in Quebec City.

American Chemical Society- Division of Agriculture and Food Chemistry
Fellow, American Chemical Society, Division of Ag Food Chemistry

Program Chair-2006- Division of Agricultural and Food Chemistry (2,700 members) of the American Chemical Society (14,000 members).

Chair-2007-Division of Agricultural and Food Chemistry (2,700 members) of the American Chemical Society (14,000 members).

Nomination Committee Chair- 2008. Division of Agricultural and Food Chemistry.

Co-Chair: International symposium on "Pre-and postharvest and processing effect on bioactive health maintaining properties" as a part of the AGFD division of the American Chemical Society-2008

Co-chair: International Symposium on "Agricultural and Food Derived Natural Products for Preventing and Combating Disease" as a part of the AGFD division of the American Chemical Society- 38 speakers-2010

Member, International Society for Horticulture Sciences
Member, International Society of Citriculture
Association of Horticulturists of Indian Origin: Chair 2007, Life Member
Moderator of the Third biennial Society meeting for Free Radical Research-Asia and Sixth Annual meeting of the Society for Free radical research-India (SFRR-India), 2007
Rio Grande Horticulture Society: President 2007, Life Member
Served as a member of the International Society for Nutraceutical and Functional Conference 2009
Served as a member of the International Organizing Committee- Second International Symposium on Translational Research: Natural Products and Cancer 2007-2008
Served as a member of the Southern American Society for Horticultural Sciences 2007-2012
Adjunct Graduate Faculty – Department of Horticulural Sciences, University of Agril. Sciences, Dharwad, India 2007-2012
Adjunct Graduate Faculty – Department of Crop Physiology, University of Agril. Sciences, Dharwad, India 2007-2012

Awards and recognitions 2007-2012

Received the 2010 Vice Chancellor Research Excellence Award, Texas A&M University, Texas AgriLife -2010.
Special Recognition for outstanding Contribution and dedicated Services to the Kannada Community of North America by the Association of Kannada Koota of North America, Edison, New Jersey, USA-September 2010.
Inducted as a fellow of the Division of Agriculture and Food Chemistry, American Chemical Society, 2009.
Inducted as a fellow of the American Society for Horticulture Sciences, 2009.
Inducted as a Faculty Fellow of the Texas A&M University AgriLife, College Station, TX 2009.
Harold Brent Pemberton  
Professor of Ornamental Horticulture  
b-pemberton@tamu.edu

Program Summary  
Dr. Pemberton has a research appointment at the Texas A&M AgriLife Research and Extension Center at Overton, Texas. He has been a project leader for Ornamental Research since 1982. His research specialties include bedding plant production and greenhouse and garden performance evaluations, postharvest performance, field and nursery production of garden roses, and plant growth regulators. He is Chair of the Executive Board for the Texas Superstar® Program. His research efforts are highly integrated with Extension programs through joint efforts with the Texas Superstar® program and the Master Gardener programs in Smith and Rusk Counties.

Academic Background  

<table>
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<tr>
<th>Degree</th>
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<th>Major</th>
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<tr>
<td>Ph.D</td>
<td>1983</td>
<td>University of Minnesota</td>
<td>Ornamental Horticulture</td>
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<td>B.S.</td>
<td>1978</td>
<td>Texas Tech University</td>
<td>Ornamental Horticulture</td>
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</table>

Professional Experience:  
September 1999 to present - Professor - Horticulture, Texas AgriLife Research. Texas AgriLife Research & Extension Center, PO Box 200, Overton, Texas. Member of the Graduate Faculty since 1985. Member of the Plant Physiology Faculty from 1991 to 2005.

September 1988 to September 1999 - Associate Professor - Horticulture, Texas Agricultural Experiment Station. Texas A&M University Agricultural Research & Extension Center, PO Box 200, Overton, Texas.

October 1982 - September 1988 - Assistant Professor - Horticulture, Texas Agricultural Experiment Station. Texas A&M University Agricultural Research and Extension Center, PO Box E, Overton, Texas.


1980 and 1981 (Winter Quarters) - Teaching Assistant - University of Minnesota, St. Paul, Minnesota.

October 1977 to May 1978 - Student Assistant - Texas Tech University, Lubbock, Texas.

Publications 2007-2012

Refereed Publications (underlined names indicate graduate students in the faculty members lab)


Refereed Symposium proceedings 2007-2012


Popular press articles 2007-2012
4. White, B. 2007 (November). Evaluating new varieties. Livescapes - November 1 issue. Includes section about faculty member research. Also includes several images taken by faculty member.
2013 Horticultural Sciences Academic Program Review  
Section 7  
Page 134


http://agrilife.org/today/2011/05/25/turks-cap-named-new-texas-superstar/ Written about faculty member research.

http://agrilife.org/today/2011/05/27/east-texas-hort-day/ Written about faculty member research.


http://agrilife.org/today/2011/06/10/babys-breath-euphorbia/ . Written about faculty member research.


http://agrilife.org/today/2011/06/24/east-texas-horticultural-fieldday/ . Written about faculty member research.

http://gmpro.texterity.com/greenhousemanagement/201110?sub_id=abFcpQsaR9DR&folio=12#pg51 . Written about faculty member research.

http://agrilife.org/today/2011/10/31/cool-season-euphorbias/ . Written about faculty member research.

Written about faculty member research.

http://today.agrilife.org/2012/05/21/gomphrena-superstar-2012/ . Written about faculty member research.


http://today.agrilife.org/2012/06/21/mandevilla-superstar/ . Written about faculty member research.

http://today.agrilife.org/2012/06/27/lowreys-legacy-superstar/ . Written about faculty member research.


Electronic media/software (websites, software, videos, etc.) 2007-2012

1. Maintain the following website:  http://flowers.tamu.edu/

Books or chapters in books 2007-1012


Graduate students (2007-2012) 
Graduate student committees (non-advisees)

1. Ockert Greyuenstein – PhD
2. Andrew King – PhD
3. Qianni Dong – PhD

Grants and contracts awarded 2007-2012

1. USE OF CONTROLLED RELEASE FERTILIZER ON POTTED BARE-ROOT ROSES GROWN FOR BUD
AND BLOOM SALES.  B. Uber.  2007.  $12,500 for 1 year.

2. USE OF TIBERON (CYCLANILIDE) IN CONJUNCTION WITH PRUNING TO PROMOTE BRANCHING IN WOODY SPECIES.  Bayer Environmental Science.  2007.  $6000 for 1 year.

3. PLANT GROWTH REGULATOR STUDIES.  IR4 Program.  2007.  $3000 for 1 year.

4. FUNDING FOR FIELD DAY SPONSORSHIP.  Kinney Bonded Warehouse, Syngenta, PanAmerican Seed, Chamblee’s Roses, and Floranova, Goldsmith, Greenleaf Nursery, Fafard, Takaii, Benary, Ball Seed, Sakata.  2007. $2400  for 1 year.

5. UNRESTRICTED GIFT.  Texas Nursery and Landscape Association.  2006-2007.  $1000 for 1year.  One third to my project with the balance to Co-PIs K. Steddom and S. Ludwig.

6. USE OF CONTROLLED RELEASE FERTILIZER ON POTTED ROSES GROWN FROM LINERS FOR FINAL MARKETING AS OWN ROOT PLANTS.  B. Uber.  2007.  $15,000 for 1 year.

7. SCREENING QUERCUS VIRGINIANA ACCESSIONS FOR ADAPTATION TO DEMANDING ENVIRONMENTS.  Tom’s Tree Place.  2007.  $52,584 for 2 years.  $3672 to my project as Cooperator. Rest to PI C. Mckenney (Texas Tech University) and Cooperators M. Arnold and G. Niu.

8. EVALUATING NEW MIST PROPAGATION SCHEDULING TECHNOLOGIES IN THE PRESENCE OF DISEASE.  Texas Ornamental Enhancement Endowment.  2007.  $6,000 for 1 year.  $1000 to my project as Cooperate with the rest to PI K. Steddom.


10. EFFECTS OF PLANT GROWTH REGULATORS ON POSTHARVEST PERFORMANCE OF POTTED FLOWERING SPECIES.  IR4 Program.  2007.  $6000 for 1 year.

11. PLANT GROWTH REGULATOR STUDIES.  IR4 Program.  2008.  $6000 for 1 year.

12. DETERMINATION OF DROUGHT TOLERANCE AND PARENTAGE OF LIVE OAK (Quercus virginiana) AND ESCARPMENT LIVE OAK (Quercus fusiformis) ACCESSIONS FOR ADAPTATION TO DEMANDING ENVIRONMENTS.  Tom’s Tree Place.  2008.  $52,584 for 2 years  $3672 to my project as Collaborator with PI C. McKenney (Texas Tech University) and other Collaborators T. Montague, R. Wright, and D. Auld (Texas Tech University) and M. Arnold and G. Niu.


15. DETERMINATION OF DROUGHT TOLERANCE AND PARENTAGE OF LIVE OAK (Quercus virginiana) AND ESCARPMENT LIVE OAK (Quercus fusiformis) ACCESSIONS FOR ADAPTATION TO DEMANDING ENVIRONMENTS.  Tom’s Tree Place.  2008-2009.  $1836 for 2009 to my project as Collaborator with PI C. McKenney (Texas Tech University) and other Collaborators T. Montague, R. Wright, and D. Auld (Texas Tech University) and M. Arnold and G. Niu.

16. COORDINATED EDUCATION AND MARKETING ASSISTANCE PROGRAM TAG SALES.  Various Tag Companies.  2009.  $3500 for 1 year.


18. MASTER GARDENER VOLUNTEER WORK HOURS.  Smith County and Rusk County Master Gardener Associations.  2008-2009.  In kind:  1782.5 hours of labor valued at $20.25 per hour for a total of $36,096.


20. EAST TEXAS BEDDING PLANT PACK AND GARDEN TRIALS.  Various Bedding Plant Seed Companies.  2009-2010.  $15,065 for 1 year.


23. IMPACT OF CONTEGO (ABA) ON SHELF LIFE OF NEW GUINEA IMPATIENS GROWN IN POTS.  Valent Biosciences. 2009-2010.  $6000 for 1 year.

24. MASTER GARDENER VOLUNTEER WORK HOURS.  Smith County and Rusk County Master Gardener Associations.  2009-2010.  In kind:  1555 hours of labor valued at $21.47 per hour for a total of $33,386.

25. SUPPLIES FOR BEDDING PLANT TRIALS.  SunGro Horticulture and Fafard.  2009-2010.  In kind:  growing
media valued at $2373.

26. EAST TEXAS BEDDING PLANT PACK AND GARDEN TRIALS. Various Bedding Plant Seed Companies. 2010-2011. $19,950 for 1 year.

27. PLANT GROWTH REGULATORS FOR BRANCHING IN VERBENA AND CALIBRACHOA. IR-4. 2011. $6000 for 1 year.


30. MASTER GARDENER VOLUNTEER WORK HOURS. Smith County and Rusk County Master Gardener Associations. 2010-2011. In kind: 1855 hours of labor valued at $21.35 per hour for a total of $39,604.


33. EAST TEXAS BEDDING PLANT PACK AND GARDEN TRIALS. Various Bedding Plant Seed Companies. 2011-2012. $17,550 for 1 year.

34. IN SEASON LIQUID HERBICIDE CROP SAFETY ON AUCUBA AND SCAEVOLA. IR-4. 2012. $5300 for 1 year.

35. TEXAS SUPERSTAR® PROGRAM TAG SALES. Various Tag Companies. 2012. $6100 for 1 year.

36. FUNDING FOR FIELD DAY SPONSORSHIP. Various Ornamental Plant Companies and Trade Organizations. 2012. $5125 for 1 year.

37. MASTER GARDENER VOLUNTEER WORK HOURS. Smith County and Rusk County Master Gardener Associations. 2011-2012. In kind: 1545 hours of labor valued at $21.91 per hour for a total of $33,851.


Review panels for grants and journals
Editorial boards on which you served 2007-2012
1. Journal of the American Society for Horticultural Sciences

Journals for which you reviewed papers 2007-2012
1. Journal of the American Society for Horticultural Sciences
2. HortScience
3. HortTechnology
4. European Journal for Horticultural Science
5. Horticultural Science
6. Scientia Horticultural
7. Journal of the Science of Food and Agriculture

Internal university / agency service on committees 2007 – 2012
1. Texas A&M AgriLife Research Safety Officer for the Overton Center,
3. TAMU Department of Horticultural Sciences Tenure and Promotion Committee, 2000 – present
4. TAMU Department of Horticultural Sciences Mentoring Committee for Dr. Xin Wang Wang at the Dallas Research Station, 2009 – present
5. Texas A&M AgriLife (TCE/TAES) Executive Committee of the Texas Superstar® Program, member 1999 – present; chair 2009 – present
7. TAMU College of Agriculture and Life Sciences Horticultural Sciences Department Head Search Committee, member 2012
8. Texas A&M AgriLife Extension Steering committee for the IPM specialist program at the Overton Center, 2002-
2011

Professional association leadership roles 2007-2012
  1. Serve as a Consulting Editor for The Journal of American Society for Horticultural Sciences in the area of development physiology, 2004-present
  2. Served on the International Society for Horticultural Science Scientific Committee for the 5th International Rose Symposium in Gifu, Japan, 2009

Awards and recognitions 2007-2012
Elizabeth A. Pierson  
Associate Professor, Plant-microbe Interactions  
eapierson@tamu.edu  

Program Summary  
Dr. Pierson’s appointment includes Research, Teaching, and Service. Areas of research include plant-microbe interactions, biological control, and sustainable agriculture. She is a member of the Graduate Faculties of Horticultural Sciences, Plant Pathology, and the Molecular & Environmental Plant Sciences (MEPS) interdisciplinary program. She teaches the undergraduate course Garden Science (HORT301) and the graduate course Plant-associated Microorganisms (HORT/MEPS/PLPM689). She also serves as chair or member of graduate research committees and provides undergraduate laboratory research experience. She is a member of the Horticultural Sciences Graduate Committee and the Molecular and Environmental Plant Sciences Admissions Committee and is the advisor for the Horticulture Graduate Council.

A major focus of the Dr. Pierson’s research is on interactions between microbes and their plant or insect hosts that provide benefits or costs to plant health. One research area involves the use of Pseudomonas chlororaphis strain 30-84 for the biological control of take-all disease of wheat. Our work has focused on the ecological significance of molecular signaling between bacterial populations on plant roots and the roles of secondary metabolites produced by strain 30-84 in pathogen inhibition, biofilm formation, and rhizosphere competence. Recent work with strain 30-84 involves the genetic and ecological characterization of sensory transduction pathways, which likely provide the mechanisms for the evolution of interactions between microbial species and possibly with plants. Current work is focused on testing specific hypotheses regarding how different signal transduction pathways affect microbe-microbe and microbe-host interactions on plant surfaces. Our collaborations with research groups focused on other biological control Pseudomonas species have resulted in the sequencing of the genomes of eight plant-associated Pseudomonas strains (including strain 30-84) facilitating genomic comparisons among biological control strains and other Pseudomonas species including human-pathogenic ones. Other ongoing work is focused on two emerging plant diseases that are threatening potato (zebra chip disease) and citrus (citrus greening) production in Texas and elsewhere in the United States. Both diseases are caused by insect (psyllid) transmission of newly discovered, non-culturable bacterial plant pathogens (Candidatus Liberibacter species). Our collaborative research has included the development of better detection methods (improved PCR primers, LAMP, and one-step detection) and enhancements to screening methods for the selection of disease tolerant plant material. An important goal has been the development of knowledge and applications to assist growers.

Academic Background

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<tr>
<td>Ph.D.</td>
<td>1987</td>
<td>Washington State University</td>
<td>Botany (Ecology, Evolution, &amp; Systematics)</td>
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<td>B.S. Honors</td>
<td>1982</td>
<td>Indiana University</td>
<td>Biology</td>
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Professional Experience

2009-present  
Associate Professor, Horticultural Science, Texas A&M University and Texas AgriLife Research, College Station, TX (75% Research, 25% Teaching, 5% Service).

1999-2009  
Research Associate Professor, Division of Plant Pathology and Microbiology, Department of Plant Sciences, The University of Arizona, Tucson, Arizona.

1990-1999  
Research Assistant Professor, Dept of Plant Pathology, The University of Arizona, Tucson, AZ.

1989-1990  
Research Associate, USDA-ARS Root Disease and Biological Control Research Unit, Washington State University, Pullman, WA.

1987-1988  
Statistical Consultant, Computer Information Center, Washington State University, Pullman, WA.

1982-1987  
Teaching/Research Assistant, Dept. of Botany, Washington State University, Pullman, WA.

Publications 2007-2012  
Post-doctoral scholars, Graduate students, and Undergraduate students mentored by me. This includes students I worked with directly in lab or on whose committees I served or chaired.

Referred Publications

Recently submitted:

Lévy J, J Hancock, A Ravidnran, D Gross, C Tamborindeguy, and E Pierson. Methods for rapid and effective PCR-based detection of ‘Candidatus Liberibacter solanacearum’ from insect vectors Bactericera cockerelli: streamlining the DNA extraction/purification process (accepted Journal of Economic Entomology).


Published:


Editor reviewed publications or conference proceedings 2007-2012

In: J. Supak editor, Final Performance Report Texas Zebra Chip Disease Research Grant Program. Submitted to Grantor: Texas Department of Agriculture.


Popular press articles 2007-2012
None

Electronic media/software (websites, software, videos, etc.) 2007-2012
All courses are available to registered students via the Horticultural Sciences eLearning website: https://www-horticulture.tamu.edu/courses/.
Participant: Earth Emphasis website. This website featured our publication, “Regional demographic trends from long-term studies of saguaro (Carnegiea gigantea) across the northern Sonoran Desert” as being of special interest to the progress in the Earth Sciences field. The paper was featured on their website as a Key Research Article in January 2013, Earth Emphasis: www.EarthEmphasis.com

Books or chapters in books 2007-2012
None

Classes taught (2007-2012)

Undergraduate courses
HORT 301: Garden Science, Fall 2011, 2012
BESC 484: Field Experience, Spring 2013

Graduate courses
Texas A&M University
HORT689/MEPS689/PLPM689: Plant Associated Microbes, Taught Spring 2013, Fall 2010.
HORT691/PLPM691: Research, each semester year-round from Fall 2010 - present.

University of Arizona:
PLP 550: Principles of Plant Microbiology, Fall 2013, 2008
PLP 551: Biology and Characterization of Plant Pathogenic Agents, Fall 2007
Dr. Yan Ma, visiting scientist from China, 2012, Texas A&M University
Dr. Dongping Wang, 2011 to present, Texas A&M
Dr. Candace Seeve, 2010 to 2012, Texas A&M University
Dr. Julien Levy, 2009 to present, Texas A&M University
Dr. Meenal Vyas, 2008 to 2009, The University of Arizona

Graduate students (2007-2012)
Advised/co-advised
Co-Chair: Anne McCoy Estes, PhD. Ecology and Evolutionary Biology Department, Graduated 2009
Chair: Jun Myoung Yu, Ph. D candidate, Plant Pathology and Microbiology, start 2010.
Co-Chair: Jenita Thinakaran, Ph. D candidate, Horticultural Sciences, start 2011.
Chair: Yan Yang, Ph. D candidate, Horticultural Sciences, start 2012.

First job taken by each of your graduate students or post-doctoral associates 2007-2012
Dr. Candace Seeve: Lecturer, Baylor University, Waco, TX
Dr. Anne Estes: Visiting Assistant Professor & Instructor for General Biology, Towson University, Towson, MD

Graduate student committees (non-advisees)
Graduated, University of Arizona:
William Wallace Driscoll, Ph.D. Ecology and Evolutionary Biology Department, 2012
Carol Rowand, MS. Plant Pathology and Microbiology/Department Plant Sciences, 2010
Perisamy (Ravi) Chitrampalam, PhD. Plant Pathology & Microbiology/Department Plant Sciences, 2009
VSR Krishna Maddula, PhD. Division Plant Pathology & Microbiology/Department of Plant Sciences, 2008
Monica Mendez, Ph.D. Department of Soil Water and Crop Sciences, 2007

Graduated, Texas A&M:
Poulami Basu Thakur, MS. 2011, Plant Pathology and Microbiology
Justin Park Ho Ng, PhD. 2012, Soil and Crop Sciences
Brandon Hassett, MS. 2012, Plant Pathology and Microbiology

Current Students:
Vanessa Vaughn, Ph. D candidate, Plant Pathology and Microbiology
Brittany Sousa, MS candidate, Soil and Crop Sciences
Ryan Syrenne, Ph. D candidate, MEPS
Sasha Kay, Ph. D candidate, Entomology
Wenwei Lin, Ph. D candidate, Plant Pathology and Microbiology

Interdisciplinary program participation (2007-2012)
Member, Graduate Faculties of Horticultural Sciences, Plant Pathology, and the Molecular & Environmental Plant Sciences (MEPS) interdisciplinary program, Texas A&M University (TAMU), 2009.

Grants and contracts awarded 2007-2012
Agency: Texas Department of Agriculture Specialty Crop Block Grant Program. Title: Development of Simplified Methods for Rapid and effective Screening of Psyllids and Plant Tissues for the Citrus greening and potato zebra chip pathogens. PI: Dennis C, Gross, Co-PI: Elizabeth Pierson. Amount: $54,600 (27,300 to EA Pierson). Duration: 1/01/13-12/31/13
Agency: SCRI Mini Grant Program: Zebra Chip Research. Title: Evaluation of ZC-tolerant advanced selections and field-selected sub-clones under carefully monitored insect pressures and in medium scale field trials. PIs: Elizabeth Pierson, Co-PIs: Creighton Miller, Ron Henne, and John Jifon. Amount: $25,000 ($25,000 to EA Pierson). Duration: 12/11-12/12

Other grant support contributing research community:


Grant review panel service 2007-2012
National Institute of Health: Host-Associated Microbial Communities Panel 2012
US Department of Agriculture: Microbial Biology Panel 2009

Grant programs for which you reviewed proposals:
NSF Division Integrative Organismal Biology: NSF CAREER, NSF Division of Integrative Organismal Systems: Symbiosis, Defense, and Self-Recognition; USDA/CREES/ NIFA Plant-associated microbes and biological control; Department of Energy Experimental Program to Stimulate Competitive Research (DOE/EPSCoR); Pierce's Disease Control Program of the California Department of Food and Agriculture; The University of Florida/IFAS Citrus Canker and Citrus Greening Program.

Editorial boards on which you served 2007-2012
Associate Editor, Molecular Plant-Microbe Interactions, April 2013-

Journals for which you reviewed papers 2007-2012

Internal university / agency service on committees 2007 – 2012
Faculty Advisor, Horticulture Graduate Council, TAMU 2010-
Member, Horticultural Sciences Graduate Curriculum Committee, TAMU 2011-
Member, Horticultural Sciences Undergraduate Sustainable Agriculture Curriculum Development Committee, TAMU 2011-
Member, Horticultural Sciences Safety Committee, TAMU 2011-
Member, MEPS Graduate Student Recruitment Committee, TAMU, 2010-
Member, MEPS Curriculum Revision Committee, TAMU, 2010-
Research Host, NSF-REU Summer Undergraduate Research Program, TAMU, 2012
Member, AgriLife Faculty Leadership Committee, TAMU, 2009-10
Appointed Member, Professional Advisory Council: College of Agriculture & Life Sciences (CALS), UA 2008-9
Member, Department of Plant Pathology (Dept. PP) Peer Review Committee, UA 2007
Student Research Host, Department of Plant Pathology Winter-term Fellowship Program, UA, 2002-9

Professional association roles 2007-2012
Member, American Phytopathological Society (formerly, Pacific Division; now Southern and Caribbean Divisions)
Member, American Society of Horticultural Science (Sustainable Agriculture Working Group)
Member, American Society for Microbiology
Member, Texas Sustainable Agriculture Research and Education (SARE) Advisory Committee, 2010-
Member W2147: Managing Plant Microbe Interactions in Soil to Promote Sustainable Agriculture

Awards and recognitions 2007-2012
Selected by students as Faculty Advisor, Horticulture Graduate Council, 2010-present
David Wm. Reed  
Professor of Horticulture  
Associate Dean for Graduate Programs and Faculty Development  
dwreed@tamu.edu

Program Summary
David Wm. Reed is Professor of Horticulture in the Department of Horticultural Sciences at Texas A&M University. He is also the Associate Dean for Graduate Programs and Faculty Development in the College of Agriculture and Life Sciences. He is a native of Krotz Spring, Louisiana. He obtained his B.S. degree from the University of Southwestern Louisiana (now called University of Louisiana – Lafayette) in Lafayette, LA... He received both his Master of Science and Doctor of Philosophy degrees from Cornell University. He has been on the faculty at Texas A&M University since 1978, and has a joint teaching and research appointment. His research ranges from basic to applied and primarily focuses on nutrition, especially iron nutrition, and the effects of water quality and salinity on greenhouse crops. He Chaired seventeen and mentored nearly fifty graduate students, has authored or co-authored forty-five refereed publications and sixty-five conferences papers and abstracts. His “first love” is teaching, and he has taught four different undergraduate and four different graduate courses, both at Texas A&M University and invited at International Universities. He has taught the introductory science elective Horticulture Science and Practices for thirty-four years to a packed house of 250 to 340 students each semester for a total of over 19,000 students. As an extension of his desire to teach, he has presented nearly seventy talks at various industry and professional meetings throughout the country. His presentations incorporate demonstrations and workshops so the participants take home “how to” as well as “academic” knowledge. He is the Co-Author and Editor of Water Media and Nutrition for Greenhouse Crops, Ball Publishing, and Reed, D.W. Horticulture – Science and Practices. 1999. Burgess Publishing.

Academic Background

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<tr>
<td>Ph.D.</td>
<td>1979</td>
<td>Cornell University</td>
<td>Floriculture and Ornamental Horticulture</td>
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<tr>
<td>M.S.</td>
<td>1977</td>
<td>Cornell University</td>
<td>Floriculture and Ornamental Horticulture</td>
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<tr>
<td>B.S.</td>
<td>1974</td>
<td>University of Southwestern Louisiana</td>
<td>Agriculture</td>
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Professional Experience
1978-83 Assistant Professor, Dept. Horticultural Sciences, Texas A&M University, College Station, TX  
1983-90 Associate Professor, Dept. Horticultural Sciences, Texas A&M University, College Station, TX  
1990-present Professor, Dept. Horticultural Sciences, Texas A&M University, College Station, TX

Administrative Experience
Interim Head, Dept. Agriculture Leadership, Education & Communications, Jan.-Sept. 2008  
Chair, Graduate Program Council, College of Agriculture and Life Sci., Member 88-91, Chair 1992-present.  
Chair, Graduate Council, Texas A&M University, Member 1992-present, Chair 2007-2010  
Graduate Coordinator, Dept. Horticultural Sciences, Texas A&M University, 1984-1995  
Associate Head for Graduate Studies, Dept. of Horticultural Sciences, Texas A&M University, 1995-2002  
Associate Dean for Graduate Programs and Faculty Development, College of Agriculture and Life Sciences, Sept. 2008-present

Awards and Honors:
Special Honors
Keynote Speaker “Become the Best You Can Be”, 2004 Freshman Convocation, Texas A&M University, College and University Teaching Awards and Honors  
Distinguished Achievement Award for Teaching, College Level, 1990, Association of Former Students, Texas A&M University
Vice Chancellor’s Award in Excellence for Undergraduate Teaching, 1995, College Level, The Agriculture Program, Texas A&M University

Distinguished Achievement Award for Teaching, University Level, 1999, Association of Former Students, Texas A&M University

Council of Master Teachers, College of Agriculture and Life Sciences, Texas A&M University, member 2004

Student Originated Teaching Awards and Honors

Professor of the Year in Agriculture, 1995, Delta Delta Delta Sorority, Texas A&M Chapter

Outstanding Contributions as a Professor, 1998, Pi Beta Phi, Texas A&M Chapter

Faculty Award, Horticulture Graduate Council, 2002, Texas A&M University

Fish Camp Namesake, Camp Reed, the Sea Surfin’ Canaries, August 1993, Texas A&M University

T Camp Namesake, Camp Reed, the Red Hot Reggae Rainmakers, August 1996, Texas A&M University

T Camp Namesake, Camp Reed, the Rockin’ Red Hot Crawdaddy Pinchers, August 2002, Texas A&M Univ.

Professional Scientific Society Teaching Awards

L.M. Ware Distinguished Teaching Award, 1989, Regional Level, Southern Region of the American Society for Horticultural Sciences

Outstanding Undergraduate Educator Award, 2002, National Award, American Society for Horticultural Sciences

Professional Society Honors

President-Elect 2003, Southern Region of the American Society for Horticultural Sciences

Courses Taught

Undergraduate:

HORT 201 - General Horticulture (fall, spring 1979-present)
HORT 202 - General Horticulture Laboratory (fall, spring 1979-present)
HORT 225 – Horticulture Learning Community (spring 2004, every fall 2004-present)
HORT 320 - Exotic Plants (fall 1984-87)

Graduate:

HORT 602 - Environmental Relations of Horticultural Crops (alt. fall 1980-84)
HORT 604 - Applied Physiology of Horticultural Crops (alt. spring 1985-present)
FLOR 616 - Asexual Plant Propagation (alt. spring 1979-83)
PPHY 620 – Exp. Tech. in Plant Physiology; lab on Use of Liquid Scintillation Counting (spr. 1983-87)

Invited International Undergraduate

Plant Propagation, Soilless Growing Media and Simple Soil and Water Testing. July 2007 University of Veracruz at Xalapa, Xalapa, Mexico. Condensed 2-day undergraduate lecture and laboratory demonstration course

Invited International Graduate:

Applied Physiology of Horticultural Crops, Fall 1985, University of Peradeniya, Peradeniya, Sri Lanka

Applied Physiology of Horticultural Crops, July 2007, Colegio de Postgraduados, Campus Montecillo, Montecillo, Mexican. An invited condensed 5-day graduate lecture course sponsored by the Mexican Academy of Sciences in cooperation with the Colegio de Postgraduados.

Theses and Dissertations:

Personal:


Graduate Students:


2. Cartmill, Andrew. 2004 (started). Studies on phosphorus nutrition of ornamental crops, Ph.D. Candidate, Texas A&M University, College Station, TX

3. Campos Nunez, R. 1990. The influence of irrigation water salinity on optimal nitrogen, phosphorus and potassium liquid fertilizer rates. M.S. Thesis, Texas A&M University, College Station, TX

4. Davis, Emily. 2006(started). Master of Agriculture student, in progress

5. Lang, H.J. 1986. The iron nutrition of tropical foliage plants. M.S. Thesis, Texas A&M University, College Station, TX
7. McDonald, G.V. 1990. The iron reductase activity of selected rose rootstocks. M.S. Thesis, Texas A&M University, College Station, TX
8. Neary, B.C. 1986. The feasibility of a nursery operation at Due Process Stables. M.Ag. Professional Paper, Texas A&M University, College Station, TX
11. Shafer, W.E. 1984. Foliar absorption of potassium and cuticular penetration characteristics of potassium and selected organic compounds, Ph.D. Dissertation, Texas A&M University, College Station, TX
12. Spurlin, Q. 1986. An instructional unit on plant propagation for use in secondary horticulture and science courses. M.Ag. Professional Paper, Texas A&M University, College Station, TX
16. Valdez-Aquilar, L. 2004. Identify levels of carbonate tolerance of ornamental crops. Ph.D. Dissertation, Texas A&M University, College Station, TX
17. Vollmar, C. 1998 (started). Greenhouse production/management. M.Agr., Texas A&M University, College Station, TX

Referred Publications:
19. Reed, D.W. 1983 Triton X-100 as a complete liquid scintillation cocktail for counting aqueous solutions and
*J. Plant Nutrition* 6(8):667-677
11:1429-1437
pH of several growth retardants. *HortScience* 18(6):881-882
developed in different temperatures and light intensities. *The Plant Cuticle,* eds. D.F. Cutler, K.L. Alvin
and C.E. Price, Academic Press, NY
as foliar sprays and soil application. *J. Plant Nutr.* 11:1369-1378
controlled release fertilizer in a recirculating subirrigation and top-watering system. *HortScience* 39(2):280-
286
32. Shafer, W.E. and D.W. Reed. 1986. The foliar absorption of potassium from organic and inorganic potassium
rootstocks to bicarbonate. *J. Plant Nutr.* 16(6):1039-1046
39. Valdez-Aguilar, L. and D.W. Reed. 2007. Response of selected greenhouse ornamental crops to alkalinity in
irrigation water. *J. Plant Nutrition* 30(3):441-452
40. Valdez-Aguilar, L. and D.W. Reed. 2006. Comparison of growth and alkalinity-induced responses in two
41. Valdez-Aguilar, L. and D.W. Reed. 2008. Influence of Potassium Substitution by Rubidium and Sodium on
Growth, Ion Accumulation, and Ion Partitioning in Bean (*Phaseolus vulgaris* L.) under High Alkalinity, *J.
Plant Nutrition* (accepted)


Abstracts and Conference Papers:


10. Andrew Cartmill and David Wm. Reed. 2007. Effect of Phosphorus Concentration on *Catharanthus roseus* (L.) G. Don cv. Pacifica Red in a Recirculating and Top Watering System. 2007 Southern Region ASHS Annual Meetings


42. Reed, D.W. 2004. Active classroom participation and demonstrations to excite non-science majors about the science of horticulture. Abstract, Southern Regional Meetings, American Society for Horticultural Sciences, Tulsa, OK.

**Invited Papers at Scientific Symposia and Academic Institutions:**

5. Reed, D.W. 1997. Plant selection versus fertilizer selection strategies to combat iron nutrition problems in ornamental plants. 94th Annual Conference of the American Society for Horticultural Sciences, Salt Lake City, UT.


Books and Manuals:
4. Also see papers in *The Plant Cuticle* under REFEREED PUBLICATIONS.

Grants and Contracts:
$500 Chemical and ultrastructural studies on cuticles. Faculty/Staff Mini-Grant Texas A&M, Jan. 1979-1980.
$4,000 Foliar nutrition - factors affecting performance, Program Development Funds, Texas Agri. Exp. Station, 1982.
$13,775 Nutrient analysis by ion exchange chromatography, Program Development Funds, Texas Agri. Exp. Station, 1989.
$75,000 Minimizing nitrogen runoff from greenhouses and nurseries using recycled irrigation water and constructed wetlands. Co-Principle investigators H. Lang, E. McWilliams and D. Wilkerson. Research Enhancement Program, Texas Agricultural Experiment Station, 1993-95.
$50,000 Develop strategies to maximize accumulation of the anti-cancer compound camptothecin in Camptotheca – A new crop for Texas agriculture. Co-Pi M. Rumpho and d. Lineberger. TAES Faculty Research Development Program, 1997-98.
$500 Cuticle and leaf surface characteristics related to the effectiveness of compounds applied to the foliage of ornamental plants. R.P. White Grant, Horticultural Research Inst. (HRI), Washington DC, June 1979-1980.
$6,000 A study of cuticle and leaf surface properties to determine the effectiveness of compounds applied to the foliage of ornamental plants. The Fred Gloeckner Equipment Grant, Fred C. Gloeckner Foundation, June, 1979-1980.
$4,000 Alleviation of nutrient deficiencies and maintenance of optimum nutrient levels, especially through foliar application, for maximum production efficiency. Weyerhaeuser Co., Dec., 1979-1980.
$2,000 Phytotoxicity of Select on Ornamentals. Valent Corp., March 1992-93.
$2,000 Sumagic on bedding plants. Valent USA Corp., June 1992-93.
$3,500 Sumagic on bedding plants. Valent USA Corp., April 1993-94.


$12,000  Reassessing water quality for greenhouse crop production. The Fred Gloeckner Foundation, Inc., June 2001-02, extension.

$5,000  Studies on water quality for ornamental crops. Texas Nursery and Landscape Association, 2002.

$2,600  Testing electromagnetically treated water for enhancement of seed germination and plant growth, Roger Holland, 2002

$5,000  Testing plant growth response to irrigation with recycled/reused water from nursery operations. Texas Nursery & Landscape Association Education & Research Foundation, 2006-2007
Terri Woods Starman  
Professor of Floriculture/Horticulture  
tstarman@tamu.edu

**Program Summary**
Dr. Starman holds a three way split between teaching, research and service. Teaching responsibilities include three undergraduate courses and one graduate course in the field of floriculture production and marketing and greenhouse management. She also serves as the co-chair of two Ph.D. student committees and as a member of about three graduate student committees within the Department. Her research program involves investigations in three primary areas, including stress physiology, postharvest physiology, and greenhouse water conservation. Much of the stress physiology program has been aimed at determining stress tolerance of landscape roses and other ornamentals to salinity, heat, and drought exposure. The postharvest physiology program is to investigate greenhouse production practices which maximize shelf life of potted flowering plants and garden/bedding plants. Greenhouse water conservation projects use time domain transmissometry (TDT) sensors to apply constant soil moisture content (SMC) to landscape roses and other greenhouse crops. In a service capacity, Dr. Starman holds or has recently held officer positions with the national level American Society for Horticultural Sciences and with the national Pi Alpha Xi honors organization, as well as positions on the editorial board for *HortScience*.

**Academic Background**

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<tr>
<th>Degree</th>
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<th>Institution</th>
<th>Major</th>
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<tr>
<td>Ph.D.</td>
<td>1986</td>
<td>Texas A&amp;M University</td>
<td>Floriculture</td>
</tr>
<tr>
<td>M.S.</td>
<td>1980</td>
<td>University of Missouri</td>
<td>Horticulture</td>
</tr>
<tr>
<td>B.S.</td>
<td>1977</td>
<td>University of Missouri</td>
<td>Horticulture</td>
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</table>

**Professional Experience:**

- **2012 – present**  
  Professor, Dept. Horticultural Sciences, Texas A&M University  
  (60% teaching, 39% research, 1% service)
- **2000-2012**  
  Associate Professor, Dept. Horticultural Sciences, Texas A&M University  
  (60% teaching, 39% research, 1% service)
- **1997-2000**  
  Associate Professor, Dept. of Ornamental Hort. & Landscape Design, University of Tennessee  
  (25% teaching, 75% research)
- **1991-1997**  
  Assistant Professor, Dept. of Ornamental Hort. & Landscape Design, University of Tennessee  
  (25% teaching, 75% research)
- **1986-1991**  
  Assistant Professor, Department of Plant and Soil Science, Southern Illinois University  
  (50% teaching, 50% research)
- **1977-1981**  
  Instructor, Department of Horticulture, University of Missouri  
  (100% teaching)

**Publications 2007-2012**

**Refereed Publications**


Editor reviewed publications or conference proceedings 2007-2012


Popular press articles 2007-2012


Electronic media/software (websites, software, videos, etc.) 2007-2012
Maintain four class websites:
HORT 428 website: http://aggie-horticulture.tamu.edu/
HORT 426 website: http://aggie-horticulture.tamu.edu/
HORT 626 website: http://aggie-horticulture.tamu.edu/
HORT 427 website: http://aggie-horticulture.tamu.edu/

Books or chapters in books 2007-1012

Patents / plant variety releases / plant variety patents
None
Classes taught (2007-2012)

Undergraduate courses
Horticulture 428, Commercial Greenhouse Management: every fall 2007-2012
Horticulture 427, Floriculture Crop Production: every spring 2007-2012
Horticulture 426, International Floriculture Marketing 2009-2013 (every other year)
Horticulture 485, Problems in Horticulture: Fall 2009 and 2011

Graduate courses
Horticulture 626, International Floriculture Marketing 2009-2013 (every other year)
Horticulture 691, Research, 2007-2012

Graduate students (2007-2012)
Advised/co-advised
Xiaoya Cai, 2010-present, PhD, TAMU, Proposed dissertation title: Response of Selected Garden Rose Cultivars to Drought and Salt Stresses.
Ockert Greyvenstein, 2010-present, PhD, TAMU, Proposed dissertation title: Screening and Breeding for Heat Tolerance in Rose.
Alison Bingham, 2009-2012, M.S., TAMU, Thesis title: Substrate moisture content effects on growth and shelf life of "Angelonia angustifolia."
Min Lin, 2008-2011, M.S., TAMU, Thesis title: Effects of vernalization duration, light intensity during vernalization and low temperature holding after vernalization on flowering of nobile dendrobium hybrids

First job taken by graduate students 2007-2012
M. Lin – Breeder for Sakata in California
J. Irwin – Production Manager, J&L Vineyards and Irwin’s Greenhouses, Amarillo, TX
C. Yen – Marketing Manager for Rocket Farms, Salinas Valley, CA
J. Burns – Conservatory & Orchid Greenhouse Manager, Shangri-La Botanical Garden, Orange, TX
S. Mason – Floral Design Instructor, University of Arkansas

Graduate student committees (non-advisees)
2013-present, MA, Madeline L. Frazier, Dept. of Hort. Sci., TAMU
2012-present, M.S., Yanjun Guo (Cecelia), Dept. of Hort. Sci., TAMU
2011-2012, M.Agr. Xuan Luo (Anthea), Dept. of Hort. Sci., TAMU
2003-present, PhD. Ching-Jung Tsai (Amy), Dept. of Hort. Sci., TAMU

Interdisciplinary program participation (2007-2012)
None

Grants and contracts awarded 2007-2012
$700 - Starman, T.W. 2011. Travel award to visit Susanna Whelan (undergraduate) during her internship at Molback’s Garden Center in Seattle, American Floral Endowment.
$7,000 - Starman, T.W. 2010. The use of Pageant to improve water use and quality of ornamental plants, BASF.
$6,000 - Starman, T.W. 2009. The use of Pageant to improve post-shipment shelf life of ornamental plants, BASF.


$7,020 - Starman, T.W., H.B. Pemberton, and K. Eixmann. 2007. Fall and spring container plant trials, various floriculture breeding companies.


Review panels for grants and journals
Grant review panel service 2007-2012
None

Editorial boards on which you served 2007-2012
HortScience

Journals for which you reviewed papers 2007-2012
Journal of the American Society for Horticultural Sciences
HortScience
HortTechnology
Journal of Plant Growth Regulation
Scientia Horticulturae

Internal university / agency service on committees 2007 – 2012
TAMU, Women’s Faculty Network (WFN), member, College Station, Texas, 2012-present.
TAMU, CASNR Event Planning Certificate Committee, member, 2012-present.
TAMU, CASNR Distance Education Committee, member, 2012-present.
TAMU, CASNR AWESOME, member, 2010-present.
TAMU, CASNR Policy Congressional Intern Program Faculty Screening Committee, member, 2001 and 2010, 2011.

Professional association leadership roles 2007-2012
International Flower Juror and Speaker, Technical Contest, Proflora, 2009, Bogotá, Sponsored by the Association of Columbia Flower Exporters (Asocolflores).
Consultant 2006 – 2007, Hines Horticulture, for marketing container gardens to The Home Depot in Texas, the Midwest and the Northeast territories.
Consulting Editor for HortScience – Floriculture, 2009-present.
ASHS Education Publication Award Committee, chair, 2013-present.
ASHS Outstanding Undergraduate Educator Award Committee, member, 2010-present.
ASHS Education Publication Award Committee, member, 2010-2012.
ASHS National Floriculture Forum, member, 1993-present.
ASHS Teaching Methods Working Group, member, 2006-present.
ASHS Controlled Environment Working Group, member, 1998-present.
ASHS Floriculture Research Working Group, member, 1986-present.
ASHS Floriculture Education Working Group, member, 1986-present.
American Floral Endowment (AFE) Board of Director’s Meeting, Co-organizer and presenter for National Industry Board
Meeting College Station, TX, Jan. 2012.
OFA Short Course, speaker and co-coordinator of the workshop ‘Crop Management Workshop: Keeping You & Your
Customers Happy’ Columbus, Ohio, July 2010.
Floriculture Research Alliance, Multi-State Research Project, collaborator, 2012-present.
Water Management & Quality for Ornamental Crop Production & Health (NC1186), Multi-State Research Project, member,
2009-present.

Awards and recognitions 2007-2012
Kenneth Post Award, 2008, Award for the best floriculture manuscript published in an ASHS journal in 2008 by the
Floriculture Research Working Group of the American Society for Horticultural Sciences. Manuscript citation:
Mason, S., T.W. Starman, B. Behe, and D.L. Lineberger. 2007. Consumer preferences for price, color harmony, and
information level of container gardens. HortScience 42(4):892.
Larry Alfred Stein
Professor and Extension Horticulturist
Associate Department Head for Extension Horticulture
larrystein@tamu.edu

Program Summary
Dr. Stein is 100% Extension and works on pecans, fruits and vegetable crops. He is also a member of the CEMAP Executive Board (Coordinated Education and Marketing Assistance Program) which features the Texas Superstar® program. Dr. Stein’s work has focused on finding the best management practices for numerous crops including pecans and spinach. His work on crop load management on pecans has allowed for a more consistent production of high quality pecans from year to year. Trials on growing baby leaf spinach in the Texas Wintergarden have lead to a significant industry where before there was none. He works with other specialists to evaluate other potential crops for Texas, namely cold hardy citrus, pomegranates, blackberries, figs, pears, table grapes, and new varieties of tomatoes and watermelons. In addition he travels the state presenting programs on these various crops as well as training numerous Master Gardeners across the state. Recently he assumed the role of Associate Department Head for Extension Horticulture programs in Texas. Dr. Stein’s expertise and work in the culture of pecan has allowed the Texas A&M AgriLife Extension Service pecan educational program to become the best in the world. Numerous years of result demonstrations and research plots on crop load management and best management practices have allowed him to stay on the cutting edge of pecan growth and development. Dr. Stein and Monte Nesbitt hosted the Texas Pecan Orchard Management Short course on 23 through 27 January 2012 at Texas A&M University. Classes were held in Rudder Tower, at the USDA Pecan Breeding Station in Somerville and the newly renovated Texas A&M Pecan Orchard. We had 79 participants from two countries; Mexico (10%) and the United States. The following U.S. states had students including Arkansas, Arizona, Alabama, California, Georgia, Louisiana, Oklahoma, Wisconsin, and Texas. Fifty nine percent were from Texas. Seventy one percent of the participants were completely satisfied with the short course with the remaining percentage being mostly satisfied and 100 % would recommend the Texas A&M AgriLife Extension Service as a contact for information and assistance on pecan orchard management issues. Ninety eight percent felt like this class gave them the ability to analyze their situation and make better orchard management decisions. A large percentage (85 %) were completely satisfied with the instructor’s level of subject matter knowledge and 76 % were completely satisfied with the instructor’s responses to questions. Lastly 93% felt the practices that they adopted as a result of this program would result in real savings and increased profits. Fifty eight % felt this profit or savings would be over $500.

Dr. Stein also hosted the International Spinach conference in San Antonio, Texas 29, 30 November 2012 and then toured numerous farms and research demonstrations in the Winter Garden. He had folks from three countries; United Kingdom, Netherlands, and the United States with the following US states represented, Washington, California, Arkansas, South Carolina, Oklahoma, Missouri and Texas. Ninety one percent were mostly or completely satisfied with the event and 93 % would attend another such event sponsored by Texas A&M AgriLife Extension Service. Most importantly though, 67 % thought they would directly benefit economically as a result of attending this event.

Academic Background

<table>
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<tr>
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<tr>
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<td>Texas A&amp;M University</td>
<td>Horticulture</td>
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<tr>
<td>M.S.</td>
<td>1981</td>
<td>Texas A&amp;M University</td>
<td>Horticulture</td>
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<tr>
<td>B.S.</td>
<td>1979</td>
<td>Texas A&amp;M University</td>
<td>Horticulture</td>
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Professional Experience:

- **September 2012 – present**
  - Associate Department Head and Professor and Extension Horticulturist, Texas A&M AgriLife Extension Service

- **September 1999 – present**
  - Professor and Extension Horticulturist, Texas AgriLife Research and Extension Center, Uvalde, TX

- **September 1992 – September 1999**
  - Associate Professor and Extension Horticulturist, TAMU Research and Extension Center, Uvalde, TX

- **December 1991 – August 1992**
  - Associate Professor and Extension Horticulturist, TAMU Research and Extension Center, Stephenville, TX
June 1985 – December 1991  Extension Horticulturist, TAMU Research and Extension Center, Stephenville, TX
June 1982 – June 1985  Extension Assistant in Horticulture, Extension Horticulture, College Station, TX
January 1982 – May 1982  Technician II, Department of Horticultural Sciences, College Station, TX
December 1981 – June 1980  Graduate Assistant in Research, Department of Horticultural Sciences, College Station, TX
August 1979 – May 1980  Graduate Assistant in Teaching, Department of Horticultural Sciences, College Station, TX

Publications 2007 – 2012
Stein, L.A. 2010. Steps to protect your pecans this harvest season. Pecan South, Vol. 43, No. 9, 8 and 21.


2012
$ 818.38 Helena Chemical
$ 2,500.00 Syngenta
$ 5,000.00 BASF
$ 2,000.00 State wide watermelon
$ 2,200.00 CEMAP
$ 750.00 Texas Pecan Growers
$ 1,000.00 In kind services from Peterson’s
$10,000.00 Wintergarden Spinach Producers Board

2011
$ 1,500.00 Helena Chemical
$ 3,000.00 FMC Corp
$ 4,000.00 DuPont
$ 5,000.00 BASF
$ 2,000.00 State wide watermelon
$ 2,200.00 CEMAP
$ 750.00 Texas Pecan Growers
$ 1,000.00 In kind services from Peterson’s
$10,000.00 Wintergarden Spinach Producers Board

2010
$1,000.00 Valent
$4,500.00 Gowan
$7,500.00 Syngenta
$2,022.66 State wide watermelon
$2,200.00 CEMAP
$ 750.00 Texas Pecan Growers
$1,000.00 In kind services from Peterson’s
$6,000.00 Wintergarden Spinach Producers Board

2009
$4,000.00 Valent
$2,500.00 Syngenta
$2,000.00 Statewide watermelon
$6,000.00 Wintergarden Spinach Producers Board
$2,000.00 CEMAP
$ 750.00 Texas Pecan Growers Association
$1,000.00 In kind services from Peterson Brother’s

2008
$1,000.00 Bayer Crop Sciences
$3,000.00 Valent
$1,200.00 Agralquest
$2,500.00 Syngenta
$4,000.00 Valent
$ 68.66 Wharton County
$6,000.00 Wintergarden Spinach Producers Board
$1,000.00 CEMAP
$ 750.00 Texas Pecan Growers Association
$1,000.00 In kind services from Peterson Brother’s

2007
$7,000.00 Winter Garden Spinach Producers Board
$1,200.00 Agriliance
$1,200.00 Agra Quest
ASTRID VOLDER

Associate Professor
a-volder@tamu.edu

Program Summary
Dr. Volder’s current position description is 45% teaching / 45% research and 10% service. Responsibilities include teaching two courses each year and conducting a strong research program as well as the advising and mentoring of undergraduate and graduate students. Teaching duties include one undergraduate course in plant physiology and two graduate courses; one in the area of the ecology of constructed landscape or sustainable landscape management and one in the area of root biology, as well as graduate seminar in Fall semesters. Research responsibilities include 1) leadership in application of ecological principles and research techniques to cultivated urban landscapes and remnant or fragmented natural landscapes, 2) developing financially self-supporting research programs and forging working relationships with other faculty within and outside the department to address urban landscape and remnant or fragmented natural landscapes issues in a multi-disciplinary fashion, and 3) communicating research results by publishing in refereed journals and other relevant outlets, and making presentations at professional meetings.

Academic Background

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<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
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<tr>
<td>Ph.D.</td>
<td>1998</td>
<td>Utrecht University, Netherlands</td>
<td>Biology (Plant Physiological Ecology)</td>
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<tr>
<td>M.S.</td>
<td>1997</td>
<td>University of Washington</td>
<td>Botany</td>
</tr>
<tr>
<td>B.S.</td>
<td>1994</td>
<td>Utrecht University, Netherlands</td>
<td>Biology</td>
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Professional Experience:
2012 – present     Associate Professor, Dept. of Horticultural Sciences, Texas A&M University 2006 – 2012
Assistant Professor, Dept. of Horticultural Sciences, Texas A&M University
2004 - 2006         Postdoctoral Research Associate, Department of Forest Science, Texas A&M University 2000 - 2004
Post-Doctoral Research Fellow, CSIRO Plant Industry and Australian National University, Australia
1998 - 2000         Postdoctoral Research Associate, Department of Horticulture, Penn State University

Refereed Publications 2007-2013: (underlined names indicate graduate students advised as primary advisor or committee member)


Editor Reviewed Publications Or Conference Proceedings 2007-2013
Books Or Chapters In Books 2007-1013:

Classes Taught (2007-2013):

Undergraduate courses
- HORT 489 Urban Plant Ecology, Fall 2007, 2008
- MEPS 313 Intro Plant Physiology, Fall 2010, 2011, 2012
- HORT 485 Special projects, Summer 2012, Fall 2012, Spring 2013
- HORT 691 Undergraduate research, Fall 2011, Spring 2012

Graduate courses
- HORT 691, Research, each semester year-round from Spring 2007 through Fall 2012 at Texas A&M University.

Graduate Students (2007-2013):

Advised/co-advised

First job taken by each of your graduate students 2007-2013:

Bhavana Viswanathan (now Iyer) – landscape designer at Transasia Pvt Ltd, Bengaluru, India
Andrew Cartmill – postdoc at University of Wisconsin – Platteville
### Graduate student committees (non-advisees):

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<th>Degree</th>
<th>Name</th>
<th>Major professor</th>
<th>Department</th>
<th>Graduated</th>
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<tr>
<td>MLA</td>
<td>E. Thompson</td>
<td>Dr. Rodiek</td>
<td>Landscape Architecture &amp; Urban Planning</td>
<td>May 2008</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>D. Bryan</td>
<td>Dr. Arnold</td>
<td>Horticultural Sciences</td>
<td>Dec. 2008</td>
</tr>
<tr>
<td>M. S.</td>
<td>K. Marr-Lindgren</td>
<td>Dr. Tjoelker</td>
<td>Molecular and Environmental Plant Sciences (MEPS) / Ecosystem Science and Management (ESSM)</td>
<td>May 2009</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>C. Sung</td>
<td>Dr. Ming Han Li</td>
<td>Landscape Architecture &amp; Urban Planning</td>
<td>May 2010</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>D. Young</td>
<td>Dr. Srinivasan / Dr. Aitkenhead-Peterson</td>
<td>ESSM / Soil and Crop Sciences</td>
<td>Dec. 2010</td>
</tr>
<tr>
<td>M. S.</td>
<td>K. Liu</td>
<td>Dr. Moore / Dr. West</td>
<td>ESSM</td>
<td>Aug. 2011</td>
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<tr>
<td>MLA</td>
<td>M. Swapp</td>
<td>Dr. Li</td>
<td>Landscape Architecture &amp; Urban Planning</td>
<td>Aug. 2012</td>
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<tr>
<td>M. S.</td>
<td>K. Lenoir</td>
<td>Dr. Mark Tjoelker (University of Western Sydney, Australia) / Dr. David Briske (ESSM)</td>
<td>ESSM</td>
<td>May 2013</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>M. Luckett</td>
<td>Dr. Dooley</td>
<td>Agricultural Leadership, Education and Communications</td>
<td>May 2013</td>
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<tr>
<td>M. S.</td>
<td>B. Thomas</td>
<td>Dr. Rogers</td>
<td>ESSM</td>
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<tr>
<td>Ph.D.</td>
<td>R. Wellman</td>
<td>Dr. Boutton / Dr. Tjoelker</td>
<td>ESSM</td>
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<tr>
<td>Ph.D.</td>
<td>S. Agehara</td>
<td>Dr. Leskovar</td>
<td>Horticultural Sciences</td>
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<td>Ph.D.</td>
<td>B. Alexander</td>
<td>Dr. Aitkenhead-Peterson</td>
<td>Soil and Crop Sciences</td>
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<td>Ph.D.</td>
<td>S. Sharma</td>
<td>Dr. Leskovar</td>
<td>Horticultural Sciences</td>
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<td>Dr. Rodiek</td>
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<td>P. Mukherjee</td>
<td>Dr. Versaw</td>
<td>Biology</td>
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<td>Ph.D.</td>
<td>Y. Luo</td>
<td>Dr. Li</td>
<td>Landscape Architecture &amp; Urban Planning</td>
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<tr>
<td>Ph. D.</td>
<td>E. Hall</td>
<td>Dr. Vogel / Dr. Gan</td>
<td>ESSM</td>
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<td>Ph. D.</td>
<td>E. Wilson</td>
<td>Dr. Vogel</td>
<td>ESSM</td>
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<td>Ph. D.</td>
<td>H. Awike</td>
<td>Dr. Hays</td>
<td>Soil &amp; Crop Sciences</td>
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**Post-doctoral scholars supervised**

Dr. Cartmill “Linking root production and soil CO2 efflux”. June 2011 – November 2011
Interdisciplinary Program Participation (2007-2013):
Molecular and Environmental Plant Sciences (MEPS)

Member since March 2007
Co-PI on a TAMU-Pathways to the Doctorate fellowship 2011 (PI Gunnar Schade, Atmospheric Sciences)
Co-PI on an NSF-IGERT proposal June 2011 (PI Dirk Hays, Soil and Crop Sciences)

GRANTS AND CONTRACTS AWARDED 2007-2013:
Internal Competitive Grants:

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<th>Collaborators</th>
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<tr>
<td>2012-2014</td>
<td>TAMU</td>
<td>B. Dvorak (Landscape Architecture), D. Conlee (Atmospheric Sciences)</td>
<td>$300,000</td>
<td>$100,000</td>
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<tr>
<td>2011</td>
<td>TWRI</td>
<td>K. Laminack (M.S. student)</td>
<td>$1,500</td>
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<tr>
<td>2011</td>
<td>TWRI</td>
<td>J. Franco (Ph.D. student)</td>
<td>$1,500</td>
<td>$1,500</td>
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<tr>
<td>2009</td>
<td>TAMU - OGS</td>
<td>A. Cartmill (Ph.D. student)</td>
<td>$350</td>
<td>$350</td>
</tr>
<tr>
<td>2009</td>
<td>TAMU - OGS</td>
<td>B. Viswanathan (M.S. student)</td>
<td>$350</td>
<td>$350</td>
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<td>2009</td>
<td>College of Architecture - CRIC</td>
<td>B. Dvorak</td>
<td>$10,000</td>
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<td>2008</td>
<td>TWRI</td>
<td>B. Viswanathan (M.S. student)</td>
<td>$1,500</td>
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<td>2008</td>
<td>TAMU-PUF</td>
<td>Dr. Lombardini</td>
<td>$15,000</td>
<td>$7,500</td>
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<td>2007</td>
<td>TAMU-PUF</td>
<td>Dr. Lombardini</td>
<td>$17,500</td>
<td>$10,000</td>
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<tr>
<td>Totals</td>
<td></td>
<td></td>
<td>$347,350</td>
<td>$124,700</td>
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</table>

2012-2014 TAMU TOP grant (formerly activity 2). Multidisciplinary Experiential Learning with Green Roof Technology. Volder, Dvorak (College of Architecture), Conlee (College of Geosciences). $300,000

2011Texas Water Resources Institute (TWRI) research grant ($1,500 to K. Laminack, MSc student in Dept. of Horticultural Sciences, Green roof research).

2011Texas Water Resources Institute (TWRI) research grant ($1,500 to J. Franco, PhD student in Dept. of Ecosystem Science and Management, Sustainable agriculture research).

2009TAMU OGS travel grant to travel to the annual meeting of the Ecological Society of America in Albuquerque ($350 to A. Cartmill, PhD student in Dept. of Horticultural Sciences)

2009TAMU OGS travel grant to travel to the annual meeting of the American Society for Horticultural Sciences in St. Louis ($350 to B. Viswanathan, MSc student in Dept. of Horticultural Sciences)

2009TAMU College of Architecture, College Research and Interdisciplinary Council (CRIC) grant. B. Dvorak and A. Volder. “A Green Roof Pilot Study at the Texas A&M Architecture Center Langford Building A.” $10,000

2008Texas Water Resources Institute (TWRI) research grant ($1,500 to B. Viswanathan, MSc student in Dept. of Horticultural Sciences, Pervious pavement research).

2008Permanent Utility Fund (PUF) grant for equipment purchase ($15,000 shared with Dr. Lombardini (PI), Dept. of Horticultural Sciences). Used to buy a Licor 6400 gas exchange system.

2007PUF grant for equipment purchase ($17,500 shared with Dr. Lombardini (co-PI), Dept. of Horticultural Sciences). Used to buy a minirhizotron camera system + tubes and a soil moisture measurement system (TDR) + probes.
External Competitive Grants Funded:

<table>
<thead>
<tr>
<th>Funding Cycle</th>
<th>Source</th>
<th>Collaborators</th>
<th>Total</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2013</td>
<td>USDA</td>
<td>J. Franco &amp; C. Simpson (Ph.D. students)</td>
<td>$71,300</td>
<td>$71,300</td>
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<tr>
<td>2011-2013</td>
<td>USDA-SARE</td>
<td>Jose Franco (PhD student)</td>
<td>$10,000</td>
<td>$10,000</td>
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<tr>
<td>2008-2011</td>
<td>USDA Specialty Crops Initiative</td>
<td>UC Davis (PI) / Dr. Lombardini (co-PI, TAMU subcontract)</td>
<td>$3,221,134</td>
<td>$50,000</td>
</tr>
<tr>
<td>2007-2010</td>
<td>DOE National Institute for Climate Change Research</td>
<td>Dr. Tjoelker (PI - ESSM) and Dr. Briske (co-PI - ESSM)</td>
<td>$373,908</td>
<td>$124,636</td>
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<tr>
<td>2006-2007</td>
<td>DOE National Institute for Climate Change Research</td>
<td>Dr. Tjoelker (PI - ESSM) and Dr. Briske (co-PI - ESSM)</td>
<td>$115,000</td>
<td>$38,333</td>
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<td>$3,791,342</td>
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2012-2013. USDA Block grant via Texas Department of Agriculture (TDA) “Intercropping to Mitigate Salinity Stress on Watermelons”. **Volder**, Franco (grad. student), Simpson (grad. student), and King. Texas Department of Agriculture. $71,300.


2008 – 2012 USDA SCRI (Specialty Crops Research Initiative). Advanced sensing and management technologies to optimize resource use in specialty crops: case studies of water and nitrogen use in deciduous crops. Total value of the grant administered by UC Davis (Dr. Patrick Brown) is $3,221,134. The TAMU sub-contract for Pecan root research to Dr. Lombardini (PI) and Dr. **Volder** (co-PI) is $135,778 for three years and is shared between the PI’s.

2007 – 2010 DOE – NICCR (National Institute for Climate Change Research). Warming and rainfall redistribution effects on linkages between plant functional traits and ecosystem processes in oak savanna. Tjoelker (ESSM, PI), Briske (ESSM, co-PI), **Volder** (Horticultural Sciences, co-PI). $373,908. Each PI receives 1/3 share. Submitted but non-funded grants were omitted.

Review Panels For Grants And Journals, Grant Review Panel Service 2007-2013:
- 2012 Ad-hoc reviewer of 12 USDA-SARE graduate student grants
- 2011 Ad-hoc reviewer for NSF, Career grant
- 2010 Ad-hoc reviewer for NSF, DEB – Ecosystem Studies
- 2008 Clemson University – Hatch grant

Journals For Which You Reviewed Papers 2007-2013:
- Arctic, Antarctic and Alpine Research
- Functional Ecology
- Functional Plant Biology
- Global Change Biology
- HortScience
- Int. Journal of Biodiversity Science and Management
- Journal of Ecology
- Journal of Plant Ecology
- Journal of the Torrey Botanical Society
- Landscape Architecture and Urban Planning
- New Phytologist
- Oecologia
- Plant and Soil
Rangeland Ecology and Management
Science of the Total Environment
Tree Physiology
Urban Ecosystem

Internal University / Agency Service On Committees 2007 – 2013:
TAMU Department of Horticultural Sciences, Outcome Assessment Committee, 2008 – present.
TAMU Department of Horticultural Sciences, Undergraduate Curriculum Committee, 2011 - present
TAMU Molecular and Environmental Interdisciplinary program, Admissions Committee Feb 2012 – present
TAMU Molecular and Environmental Interdisciplinary program, Symposium committee Dec 2012 – present (incoming chair in May 2013)
TAMU Molecular and Environmental Interdisciplinary program, Executive committee July 2010 – present
TAMU College of Agriculture and Life Sciences, Protecting the Environment Grand Challenge Committee 2013 - present
Texas A&M AgriLife Research, Crop Physiologist at Uvalde Search Committee, 2012 - 2013.
Texas A&M AgriLife Extension, Ornaments Position at College Station - Search Committee, 2011
TAMU Department of Horticultural Sciences, Undergraduate Advisor - Search Committee, 2011
TAMU Department of Horticultural Sciences, Graduate Program Committee, 2010 - 2012.
TAMU College of Agriculture and Life Sciences, Horticultural Sciences Department Head Search Committee, member 2012.
TAMU College of Agriculture and Life Sciences, Montague CTE Fellow Teaching Award Evaluator, 2011, 2012.

Professional Association Leadership Roles 2007-2013:
Ecological Society of America (ESA)
Member since 1998
Member of the Physiological Ecology Section
Member of the Urban Ecosystem Section
Served as oral session chair at 2005 annual meeting in Montreal
Served as student award judge at 2007 meeting in Memphis
Served as student award judge at 2009 meeting in Albuquerque

American Society for Horticultural Sciences (ASHS)
Member since 2007
Member of the Southern Region Chapter
President elect of the rhizosphere working group in 2008
President of the rhizosphere working group in 2009
Coordinator and moderator of the rhizosphere workshop, “Genetic control of root architectural traits” at the 2009 annual meeting in St. Louis
Member of endowment committee 2010 – 2012

American Geophysical Union (AGU)
Member since 2012

International Society of Arboriculture (ISA)
Member 2007-2009
Member of the Texas Chapter
Member of the Arboricultural Research and Education Academy (AREA)

Awards And Recognitions 2007-2013
2010-2011 Montague-Center for Teaching Excellence Scholar Award for early career excellence in undergraduate teaching.
Xinwang Wang  
Assistant Professor of Ornamental Molecular Breeding

Program Summary
Dr. Wang's expertise is in breeding and molecular genetics, particularly in the use of molecular markers and other biotechnology tools to assist in ornamental plant breeding and genetic mapping in horticultural species (trees, shrubs, and herbaceous species). His initial work will be on ornamental plant horticultural traits associated molecular marker development and genomic mapping. These molecular markers will address some important horticultural gene inheritance and be applied in marker-aid selection in ornamental molecular breeding program. His final goal will develop broadly adaptive ornamental cultivars with desired horticultural traits, disease/insect resistance and environment tolerance. My main research objectives include developing improved, disease/pest resistant, and stress tolerant, ornamental flowering trees that could be utilized for all flowering trees situations throughout Southwest and otherparts of the country. New diseases are emerging at a steady rate on crape myrtle, roses and hibiscus. The need for the development of improved genetically disease resistant, insect resistant and stress tolerant flowering trees is important to the advancement of landscape management in the years to come. He is specifically interested in understanding the mechanisms of genetic resistance to powder mildew in crape myrtle, black spot in rose. Dr. Wang is conducting classical genetic studies to identify the number of genes and the type of gene action involved in resistance as well as the response to selection. He is also using molecular marker techniques to identify markers linked to disease resistance. These markers can potentially be used for (crape myrtle and rose) genomic linkage mapping as well as marker assisted selection. This will improve the efficiency of selection for improved characteristics and hasten the development of pest resistant ornamental cultivars. Overall, Dr. Wang has following research interests:  
Breeding, development and improvement of cultivars of ornamental species (crape myrtle, rose and hibiscus etc.) by molecular and traditional methodologies.  
Wild germplasm collection, evaluation and application to enhance breeding gene pool.  
Ornamental genomic mapping and identification of molecular markers closely associated with important horticultural traits. Marker-assisted breeding and map-based cloning of important genes from ornamental species to accelerate breeding process.  
Use of genetic transformation tools to manipulate or engineer ornamental species against environmental stress (cold hardiness, drought, salinity/alkalinity etc.) and insect and pathogen damages.  
I am also interested in getting involved in ornamental horticulture training and local/ national/international marketing.

Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>1998</td>
<td>China Agricultural University</td>
<td>Wheat Genetics &amp; Breeding</td>
</tr>
<tr>
<td>M.S.</td>
<td>1990</td>
<td>Henan Agricultural University</td>
<td>Wheat Genetics &amp; Breeding</td>
</tr>
<tr>
<td>B.S.</td>
<td>1986</td>
<td>Huazhong Agricultural University</td>
<td>Plant Genetics &amp; Breeding</td>
</tr>
</tbody>
</table>

Professional Experience

2009-  
Assistant Professor of Ornamental Molecular Breeding, Texas A&M AgriLife Research and Extension Center at Dallas

2004-2008  
Postdoctoral Research Associate, Department of Entomology and Plant Pathology, the University of Tennessee, Knoxville, TN.

2000-2004  
STA Fellow and Senior Research Specialist, National Institute of Agrobiological Resources (NIAS), Tsukuba, Japan.

1998-1999  
Postdoctoral, Institute of Genetics, Chinese Academy of Sciences, Beijing, China

1995-1998  
Research Assistant, China Agricultural University, Beijing, China

1990 -1995  
Research Assistant, Henan Academy of Agricultural Sciences, Zhengzhou, China.

1986 – 1987  
Extension Specialist, Xinzhou Agricultural Station, Wuhan, China.

Publications (2007-2012)


Refereed Publications


Abstracts and Presentations


Applications of microsatellites in two big bracted dogwood species, flowering and kousa dogwood. ASHS Annual Conference. Orlando, Florida, USA.


**Book Chapter (2007-2012)**


**Graduate and Postdoctoral Advisors and Advisees (2009-2012)**

Graduate students: Qianni (Tiffany) Dong-TMAU, 2011-2014; Muhammad Nadeem-TAMU, 2011-2012

Postdoctoral Research Associate: Masum Akond-FSU, 2010-2012

Postdoctoral Fellow: Shumei Jin-NFU, 2011-2012

**Journals Reviewed (2007-2012) (ad hoc)**

Journal of HortScience
Scientia Horticulturae
Mycopathologia
Journal of American Society of Horticultural Science
Plant Sciences
Pakistan J. of Agricultural Sciences
China Agricultural Sciences

**Proposals Reviewed (2007-2012)**

USAID-HortCRSP proposal review (three proposals), 2010

NIH Review panel program, 2011

**Internal University Service (2007-2012)**

Student Research Poster Competition at the 2010 Texas A&M AgriLife Conference, College Station (judge)

9th Texas A&M University System Pathways to the Dotorate student research symposium 2011 (poster judge)

**Professional Activities (since 2007)**

Member of American Society of Plant Biologists (ASPB)
Member of the American Association for the Advancement of Science (AAAS).
Member of the American Society for Horticultural Science (ASHS)
Texas Nursery & Landscape Association (TNLA)

**Funds and contracts received (2007-2012)**
2. Breeding and marker discovery for resistance to black spot of rose. **Monsanto Plant Breeding Assistantship.** $108,000 ($24,000 salary and $12,000 tuition per year) (Monsanto $54,000, AgriLife $27,000 and supervisor $27,000), 2011-2014. Major Advisor.
3. Participation in the NSF Biological Sciences (DBS) Regional Meeting at the University of Texas at Brownsville. $820. Expenses reimbursed to Texas AgriLife Research by NSF.
William C. Welch  
Professor & Landscape Horticulturist  
Texas A&M AgriLife Extension Service  
wc-welch@tamu.edu

**Academic Background**

Bill Welch received his B.S. degree in Landscape Architecture from Louisiana State University. After working several years as a landscape contractor in Houston, he returned to L.S.U. to earn his masters and doctoral degrees in Extension Education and Horticulture. He joined the Faculty at Texas A&M University in 1972.

**Program Summary**

Dr. Welch writes a monthly column for *Southern Living* magazine and contributes regularly to *Neil Sperry’s Gardens* magazine and others. He is also a contributing editor for the HORTICULTURE UPDATE newsletter.

Gardening books have been an important part of Dr. Welch’s educational program. Beginning with *Perennial Garden Color* (Taylor Press, 1989), a national “best seller” which goes beyond describing numerous perennials, annuals and roses for southern gardens to explain how to harmonize these plants in the landscape. In 1990, he authored *Antique Roses for the South* (Taylor) that pioneered a resurgence of interest in old garden roses and documented their histories and value. *The Southern Heirloom Garden* was published in (Taylor 1995) and co-authored by Greg Grant. From small swept plots to large formal landscapes southern gardeners have inherited a gardening legacy as rich and varied as the peoples who created them. In 2000, Dr. Welch coauthored *The Bountiful Flower Garden* with Dr. Neil Odenwald. It focuses on cut flower gardening starting with the influences of European, American and Asian heritage and sheds light on the rich southern tradition of sharing flowers. His most recent work is with Greg Grant and is a greatly expanded version titled *Heirloom Gardening in the South* (Texas A & M University Press, 2012). More than 500 color images and 530 pages of text brings to life the opportunities to include time tested heirloom plants and design ideas in today’s gardens.

As a Professor and Texas AgriLife Extension Service Horticulturist, Dr. Welch provides educational information and programs for county extension agents, nursery professionals, and civic groups, as well as the general public. In November 1988, the Texas Agricultural Extension Service presented Dr. Welch with the Superior Service Award citing his successful educational programs. Dr. Welch has been instrumental in developing the Texas Certified Nursery Professional program and has served on the Board of that organization within the Texas Association of Nurserymen. In 1986, he was presented the Arp Award by the Texas Association of Nurserymen for his contributions to the Texas nursery industry. He has served on the Board of the Texas Garden Clubs, Inc. as Landscape Design Course Chairman for the past 24 years and has been awarded a Lifetime membership in that organization. He is a past president and an honorary member of the Board of Directors of the Southern Garden History Society. In May, 1993, Dr. Welch was made a Member-at-large of the Garden Club of America in recognition of his programs and writings on exploring and interpreting our gardening heritage. In 2007 Zone 9 of the Garden Club of America recognized him for his contributions toward the preservation of our gardening heritage and in 2008 he was presented their Distinguished Service medal for his passion, knowledge and unselfish contributions in the name of horticulture. In June, 2009 the American Horticulture Society is presenting the Great American Gardeners Award to Dr. Welch for his accomplishments in gardening communications.

In addition Dr. Welch is also affiliated with the American Horticultural Society, American Society of Horticultural Sciences, American Rose Society, Southern Garden History Society, Heritage Roses Group, Royal Horticultural Society, Royal National Rose Society, the Garden Conservancy, and the Alliance for Historic Landscape Preservation.
Jayne M. Zajicek  
Professor of Urban Horticulture  
j-zajicek@tamu.edu

### Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Major</th>
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<tr>
<td>Ph.D.</td>
<td>1986</td>
<td>Kansas State University</td>
<td>Horticulture</td>
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<tr>
<td>M.S.</td>
<td>1982</td>
<td>University of Nebraska</td>
<td>Horticulture</td>
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<td>B.S.</td>
<td>1980</td>
<td>University of Nebraska</td>
<td>Horticulture</td>
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</table>

### Professional Experience

- **1998 - present**: Professor of Urban Horticulture, Texas A&M University, Department of Horticultural Sciences.
- **2003-2008**: Associate Department Head for Undergraduate Programs, Texas A&M University, Department of Horticultural Sciences.
- **1995-2002**: Associate Department Head for Undergraduate Programs, Texas A&M University, Department of Horticultural Sciences.
- **1992-1998**: Associate Professor of Urban Horticulture, Texas A&M University, Department of Horticultural Sciences.
- **1986-1992**: Assistant Professor of Ornamental Horticulture, Texas A&M University, Department of Horticultural Sciences.
- **1983-1986**: Assistant Instructor, Kansas State University, Department of Horticulture.

### Courses Taught

- HORT 203 - Floral Design.  
  *HORT 203 – Floral Design Web-based
- HORT 207 - Woody Ornamental Plants.  
  *HORT 432 - Landscape Design
- HORT 335 - Sociohorticulture
- HORT 428 - Greenhouse Management.
- HORT 435 – Urban Horticulture
- HORT 489 – Cooperative Teams in Horticulture
- HORT 690,691 - Theory Research and Research
- HORT 485,685 - Problems in Horticulture
- HORT 484,684 - Professional Internship

### Graduate Students Supervised

- Served or am currently serving as advisor to 38 graduate students. Students listed are only for the last 5 years.
  - M.S. 2008: Aimee Lillard
  - M.S. 2009: Danielle Cannon
  - Ph.D. 2011: Amy McFarland
  - Ph.D. Current: Aime Lillard
  - Ph.D. Current: Cole Etheredge
  - Ph.D. Current: Taylor Paine
  - M.AG Current: Heather Salopek

### Honors and Awards

- College Former Student Distinguished Teaching Award (1998)

### Professional Memberships, State, National Committees

- Member, American Society for Horticultural Science  
- Pi Alpha Xi - Honor Society for Horticulture – Member
- The Honor Society of Phi Kappa Phi – Member
Current Teaching Activities
Horticulture 203 – Floral Design – Pioneer in converting traditional lecture method of teaching to more of a computer, visual and creative method. The course is now offered in two formats, traditional lecture and computer assisted.
Horticulture 335 – Sociohorticulture
2004-2005 – Instrumental in promoting the new Bachelor of Arts degree in the Department of Horticultural Sciences at Texas A&M. The first of its kind at this University and throughout the Colleges of Agriculture in the United States.

Refereed Publications (2007-2012)
-Featured on Columbian National Public Radio.
-One of Top Ten most downloaded publications at ashs.org, American Society for Horticultural Science website.
-One of Top Ten most downloaded publications at ashs.org, American Society for Horticultural Science website.
-One of Top Ten most downloaded publications at ashs.org, American Society for Horticultural Science website.
-Featured in Self, Health and Real Simple magazines among others.
-One of Top Ten most downloaded publications at ashs.org, American Society for Horticultural Science website.
8. **APPENDICES**

Appendix 2.1 – Bachelor of Arts Emphases ......................................................................................... 8.2
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Appendix 3.2 – Horticulture Graduate Policy Manual ............................................................................. 8.38
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Appendix 6 – Department of Horticultural Sciences Strategic Plan ..................................................... 8.68
Appendix 2.1 - Bachelor of Arts Emphasis Areas  [Minor Required]

Urban Horticulture
The urban horticulture concentration is intended for students interested in professional careers which promote horticulture and emphasize people and their education and enjoyment of plants in an urban setting. Students in this emphasis area can choose to gain skills and experiences in a broad range of areas. This emphasis area prepares students for a variety of career opportunities including careers in public gardens, federal, state, and city horticulture programs, Cooperative Extension Service, professional garden writer/editor or publication manager, horticulture marketing, horticulture education and print and electronic media. Directed technical electives allow the student to concentrate in an area of their interest while encouraging the development of good people skills.

Floral Design/Event Planning
This emphasis provides a strong foundation for undergraduate students who wish to receive a Bachelor’s degree in Horticulture that is concentrated in the area of the art of floral design. Graduates in this area are highly skilled for careers in many areas of floral design including: retail floristry, international and national wholesale and retail floral marketing, floral design publishing, event planning, and floral design education.

Horticulture Landscape Design
This emphasis is tailored to provide the skills necessary for undergraduate students who wish to receive a Bachelor’s degree in Horticulture that is concentrated in the area of landscape design. This expanding field allows students with artistic capabilities to work in the horticulture arena. Landscape designers create aesthetic concepts and practical plans for improved outdoor living. Students electing this emphasis will gain the skills necessary for designing residential and small scale landscapes. Landscape designers are highly sought by garden centers, botanical gardens, arboreta, landscape maintenance and installation firms, nurseries, and governmental agencies. Private consulting is also a possibility. Some jobs will involve consumer relations and retail sales including landscape communication and publishing, landscape marketing and landscape design education.

BA HORTICULTURE: Urban Horticulture

Career Opportunities:
Horticulture teacher in high schools, technical schools and colleges
Garden writer for magazines, newspapers, TV, radio and computer technology.
Director of public garden education and administration
Employee of federal, state and city horticulture program education and administration

Horticulture Specialization Requirements (18 hours required)
These courses are required for this emphasis area:
HORT 301 Garden Science
HORT 306 Woody Ornamental Plants or HORT 308 Landscape Plant Materials or HORT 309 Interior Plants
HORT 335 Sociohorticulture
Writing Intensive HORT course (choose from HORT 225 or 315)

Choose the additional hours from the following:
HORT 306 Woody Ornamental Plants
HORT 308 Landscape Plant Materials
HORT 309 Interior Plants
HORT 423 Tropical Horticulture
HORT 426 International Floriculture Marketing
HORT 428 Commercial Greenhouse Management
HORT 429 Floriculture Crop Production
HORT 431 Nursery Production and Management
HORT 435 Urban Horticulture
HORT 440 International Horticulture
HORT 484 Internship
HORT 489 Urban Plant Ecology

Study Emphasis Electives (34 hours required) - Choose from the following: [Includes required MINOR coursework]

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<th>Recommended</th>
<th>Other Suitable Electives</th>
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<tr>
<td>Any HORT Course up to 15 hours</td>
<td>Any AGCJ Course</td>
</tr>
<tr>
<td>The following HORT courses are Highly Recommended: HORT 225 Horticulture Learning Community, HORT 306 Woody Ornamental Plants, HORT 308 Landscape Plant Materials, HORT 309 Interior Plants, HORT 423 Tropical Horticulture, HORT 426 International Floriculture Marketing, HORT 428 Commercial Greenhouse Management, HORT 429 Floriculture Crop Production, HORT 431 Nursery Production and Management, HORT 440 International Horticulture, HORT 484 Internship, HORT 489 Urban Plant Ecology</td>
<td>AGEC 105 Intro to Agricultural Economics</td>
</tr>
<tr>
<td>ALED 340 Survey of Leadership Theory</td>
<td>AGEC 314 Marketing Agriculture and Food Products</td>
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<tr>
<td>ALED 341 Team Learning</td>
<td>BIOL 328 Plants and People</td>
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<tr>
<td>AGEC 314 Marketing Agriculture and Food Products</td>
<td>FRSC 421 Urban Forestry</td>
</tr>
<tr>
<td>BIOL 328 Plants and People</td>
<td>MGMT 309 Survey of Management</td>
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<tr>
<td>FRSC 421 Urban Forestry</td>
<td>MKTG 409 Principles of Marketing</td>
</tr>
<tr>
<td>MGMT 309 Survey of Management</td>
<td>ALED 342 Learning Organizations</td>
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<tr>
<td>MKTG 409 Principles of Marketing</td>
<td>ALED 343 Human Resource Management in Agriculture and Life Sciences</td>
</tr>
<tr>
<td>ALED 344 Leadership of Volunteers</td>
<td>ALED 425 Principles of Program Evaluation in Agriculture and Life Sciences</td>
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<tr>
<td>ALED 426 Methods in Adult Agricultural Education</td>
<td>ALED 440 Principles of Technological Change</td>
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<tr>
<td>ALED 441 Agricultural Extension Organization Methods</td>
<td>ALED 442 Professional Communications in Agriculture and Life Sciences</td>
</tr>
<tr>
<td>ALED 444 Leadership of Volunteers</td>
<td>ANTH/WFSC 421 Museums and Their Functions</td>
</tr>
<tr>
<td>ALED 426 Methods in Adult Agricultural Education</td>
<td>COMM 210 Group Communication and Discussion</td>
</tr>
</tbody>
</table>

Computer Course – Choose from: AGLS 201 Computer Applications in Agriculture or INFO 209 Business Information Concepts or RENR 201 Computer Applications in Agriculture

ECHE 244 School, Family and Community Dynamics in Early Childhood Education

ECON 202 Principles of Economics

ECON 203 Principles of Economics

EHRD 374 Organizational Development

EHRD 479 Grants and Contracts

ENTO 405 Horticultural and Floricultural Entomology

FINC 201 Personal Finance

GIS Course – Choose from: AGSM 461 Geographic Information Systems for Resource Management or ESSM 324 Geographic Information Systems for Resource Management or RENR 405 GIS for Environmental Problem Solving

HLTH 221 Safety

MEPS 201 Social and Environmental Aspects of Plant Physiology

NUTR 202 Fundamentals of Human Nutrition
<table>
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<th>Course Title</th>
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<td>Urban Administration</td>
</tr>
<tr>
<td>PSYC 352</td>
<td>Organizational Psychology</td>
</tr>
<tr>
<td>RENR 205</td>
<td>Fundamentals of Ecology</td>
</tr>
<tr>
<td>RPTS 201</td>
<td>Foundations of Recreation and Parks</td>
</tr>
<tr>
<td>RPTS 202</td>
<td>Foundations of Tourism</td>
</tr>
<tr>
<td>RPTS 311</td>
<td>Recreation and Tourism Programs</td>
</tr>
<tr>
<td>RPTS 340</td>
<td>Recreation, Parks and Diverse Populations</td>
</tr>
<tr>
<td>RPTS 370</td>
<td>Youth Development Organization and Services</td>
</tr>
<tr>
<td>RPTS 402</td>
<td>Park Planning and Design</td>
</tr>
<tr>
<td>SCSC 302</td>
<td>Recreation Turf and/or SCSC 312 Introductory Turfgrass Management Laboratory</td>
</tr>
<tr>
<td>SOCI 321</td>
<td>Urban Sociology</td>
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<td>SPAN 101</td>
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<tr>
<td>URSC 415</td>
<td>Urban Issues</td>
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</table>

**Minor REQUIRED in one of the following:**

- Agricultural Communication and Journalism
- Agricultural Economics
- Business
- Communications
- Forestry
- Teaching Certification through Agricultural Science or [http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46](http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46)
- Tourism Resource Mgmt

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**BA HORTICULTURE: Floral Design/Event Planning**

**Career Opportunities:**
- Floral designer
- Retail florist
- Floral crops wholesaler
- Floral design educator
- Floral design garden writer
- Event planner

**Horticulture Specialization Requirements (18 hours required)**

**These courses are required for this emphasis area:**
- HORT 203 Floral Design
- HORT 451 Retail Floristry
- HORT 452 Floral Design: Weddings and Personal Flowers
- Writing Intensive HORT course (choose from HORT 225 or 315)

**Choose the additional 6 hours from the following:**
- HORT 301 Garden Science
- HORT 308 Landscape Plant Materials
- HORT 309 Interior Plants
- HORT 426 International Floriculture Marketing
- HORT 429 Floriculture Crop Management
- HORT 440 International Horticulture
- HORT 453 Floral Art
- HORT 454 Special Event Design and Production
- HORT 484 Internship
### Study Emphasis Electives (34 hours required) - Choose from the following: [Includes required MINOR coursework]

<table>
<thead>
<tr>
<th>Recommended</th>
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</thead>
<tbody>
<tr>
<td>Any HORT Course up to 15 hours</td>
</tr>
<tr>
<td>The following HORT courses are Highly Recommended: HORT 225 Horticulture Learning Community, HORT 301 Garden Science, HORT 308 Landscape Plant Materials, HORT 309 Interior Plants, HORT 426 International Floriculture Marketing, HORT 429 Floriculture Crop Management, HORT 440 International Horticulture, HORT 453 Floral Art, HORT 454 Special Event Design and Production, HORT 484 Internship</td>
</tr>
<tr>
<td>ACCT 209 Survey of Accounting Principles or ACCT 229 Introductory Accounting</td>
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<td>ALED 340 Survey of Leadership Theory</td>
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<td>AGEC 105 Intro to Agricultural Economics</td>
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<td>AGEC 314 Marketing Agriculture and Food Products</td>
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<tr>
<td>AGEC 315 Food and Agricultural Sales</td>
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<tr>
<td>AGEC 330 Financial Management in Agriculture</td>
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<tr>
<td>Computer course – Choose from: AGLS 201 Computer Applications in Agriculture or RENR 201 Computer Applications in Agriculture or INFO 209 Business Information Concepts</td>
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<td>ECON 202 Principles of Economics or AGEC 105 Intro to Agricultural Economics</td>
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<tr>
<td>ECON 203 Principles of Economics</td>
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<tr>
<td>MGMT 105 Intro to Business</td>
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<tr>
<td>MGMT 309 Survey of Management</td>
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<tr>
<td>MKTG 409 Principles of Marketing</td>
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<tr>
<td>RPTS 320 Festivals, Fairs and Events</td>
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<tr>
<td>RPTS 321 Festivals, Fairs and Event Management II</td>
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<tr>
<td>Other Suitable Electives</td>
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<tr>
<td>ACCT 210 Survey of Managerial and Cost Accounting Principles or ACCT 230 Intro. Accounting</td>
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<tr>
<td>AGEC 340 Agribusiness Management</td>
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<tr>
<td>AGCJ 105 Intro to Agricultural Communications</td>
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<tr>
<td>AGCJ 203 Agricultural Media Writing I</td>
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<tr>
<td>AGLS 101 Modern Agriculture Systems and Renewable Natural Resources</td>
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<td>ARTS: Any ARTS Course</td>
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<td>ENDS: Any ENDS Course</td>
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<td>FINC 201 Personal Finance</td>
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<tr>
<td>RPTS 202 Foundations of Tourism</td>
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<td>RPTS 311 Recreation and Tourism Programs</td>
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<tr>
<td>RPTS 331 Tourism Marketing</td>
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<td>Minor REQUIRED in one of the following:</td>
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<tr>
<td>Agricultural Economics</td>
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<tr>
<td>Art and Architectural History</td>
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<tr>
<td>Business</td>
</tr>
<tr>
<td>Communications</td>
</tr>
<tr>
<td>Tourism Resource Mgmt (option to include: Professional Event Manager Certificate courses as part of minor)</td>
</tr>
<tr>
<td>Teaching Certification through Agricultural Science or <a href="http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46">http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46</a></td>
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</tbody>
</table>

**BA HORTICULTURE: Horticulture Landscape Design**

**Career Opportunities:**
- Landscape designer
- Interiorscaper
- Landscape garden writer
- Landscape marketing representative
Landscape design educator
Landscape customer sales and service representative
Garden Artist/Consultant

**Horticulture Specialization Requirements (18 hours required)**

**These courses are required for this emphasis area:**
- HORT 306 Woody Ornamental Plants
- HORT 308 Landscape Plant Materials
- HORT 332 Horticulture Landscape Graphics
- HORT 432 Horticulture Landscape Design
- HORT 442 Horticulture Landscape Design II
- Writing Intensive HORT course (choose from HORT 225, 315, or 418)

**Choose the additional 1 hour from the following:**
- HORT 203 Floral Design
- HORT 309 Interior Plants
- HORT 425 Landscape Maintenance and Construction
- HORT 451 Retail Floristry
- HORT 452 Floral Design: Weddings and Personal Flowers
- HORT 453 Floral Art
- HORT 484 Internship
- HORT 489 Urban Plant Ecology
- HORT 489 Horticulture Bidding and Sales
- HORT 489 Water Management in Urban Landscapes

**Study Emphasis Electives (34 hours required)- Choose from the following: [Includes required MINOR coursework]**

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<td>MGMT 309 Survey of Management</td>
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### BA HORTICULTURE:  
Horticulture Landscape Design (continued)

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<tr>
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<td>ACCT 210 Survey of Managerial and Cost Accounting Principles or ACCT 230 Accounting Comm.</td>
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<td>ALED 341 Team Learning</td>
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<td>ALED 343 Human Resource Management in Agriculture and Life Sciences</td>
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<td>AGEC 330 Financial Management in Agriculture</td>
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<td>AGEC 340 Agribusiness Management</td>
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<td>AGCJ 105 Intro to Agricultural Communication</td>
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<td>AGCJ 203 Agricultural Media Writing I</td>
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<td>ARTS 103 Design I</td>
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<tr>
<td>ARTS 111 Drawing I</td>
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<td>ARTS 112 Drawing II</td>
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<tr>
<td>COSC 253 Construction Materials and Methods I</td>
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<tr>
<td>COSC 254 Construction Materials and Methods II</td>
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<tr>
<td>ENTO 405 Horticultural and Floriculture Entomology</td>
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<td>FINC 201 Personal Finance</td>
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<td>FRSC 420 Arboriculture</td>
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<td>FRSC 421 Urban Forestry</td>
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<td>RENR 205 Fundamentals of Ecology</td>
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<td>RPTS 201 Fundamentals of Recreation and Parks</td>
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<td>RPTS 402 Park Planning and Design</td>
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<tr>
<td>SCSC 302/312 Recreational Turf/Lab</td>
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</tbody>
</table>

**Minor REQUIRED in one of the following:**

- Agricultural Economics and Agribusiness
- Business
- Urban Planning
- Teaching Certification through Agricultural Science
Appendix 2.2 - Bachelor of Science Emphasis Areas  [Minor Optional]

Fruit and Vegetable Production and Management
More people today are aware of the importance of fresh fruits and vegetables in their diets than at any time in history. As a result, the production of these crops is increasing for domestic use and export.

The emphasis area of fruit and vegetable production specializes in the science and practice of growing, harvesting, handling, storing, processing, and marketing fruits and vegetables. This emphasis area provides students with the knowledge and skills needed to be current on new varieties, cultural practices, mechanization, weed and pest control, harvesting, storage, processing, marketing, and personnel and financial management. Students graduating in this emphasis area are prepared for careers as growers and farm managers; as production field advisors for fresh market, processing, and vegetable seed companies; or as field advisors for allied industries that manufacture production and harvest machinery, fertilizers, and agricultural chemicals. They can also find careers in fruit and vegetable marketing as managers of produce firms; as supervisors of storage; or as sales people, field advisors, buyers, brokers or managers of marketing and promotional organizations. Fruit and vegetable majors also enter the field of international horticulture as overseas supervisors for commercial companies, as participants in Peace Corps and other humanitarian endeavors, or technical assistants with USAID or international food production, research or teaching programs.

Nursery/Floral Crop Production and Management
Production of floral and nursery crops has been a rapidly expanding industry and has become a major contributor to the economy of Texas and the nation. This industry requires college graduates who understand the basics of ornamental plant production and use, and have a keen sense of business and management skills.

Greenhouses provide a protected environment for producing potted and bedding plants, cut flowers, transplants for field production and out-of-season fresh vegetables and berries. Excellent career opportunities exist for graduates specializing in greenhouse crop production.

Nursery production includes field and/or container growing of the many woody and herbaceous species utilized in landscapes or planted in orchards and vineyards. Crops types include shade and flowering trees, narrow-leaved evergreens, broad-leaved evergreens, deciduous shrubs, tree and small fruits, vines and ground covers and herbaceous perennials.

In addition, the demands for plants for environment enhancement and the need for personnel trained in the requirements of production, maintenance, marketing and utilization of these plant materials are creating exciting career opportunities. Students who study production are employed as growers and production managers in greenhouses and nurseries and as research technicians, extension specialists, and teachers. Students with interests in marketing may work with producers, wholesale suppliers, garden centers and other retail outlets.

Landscape Management
Landscape trees, shrubs, bedding plants, foliage and flowering potted plants and cut flowers have long been valued for their contributions to the quality of the environment in which we live, work and play. Successful landscape management companies provide an integrated approach to landscape contracting and managing landscape projects from inception through maintenance. The Landscape Management emphasis area focuses on plants and landscape materials, plant identification and culture, plant installation, and landscape construction and maintenance. Students in this emphasis area gain knowledge and skills to prepare them to create preliminary landscape designs, install plantings and steward their creations. Job opportunities are plentiful for individuals with targeted educational backgrounds and experience in landscape management including careers in installation, management and maintenance of interior as well as exterior landscapes. Landscape management careers span from hotels and resorts, planned communities, corporate campuses,
private estates, municipal properties, golf courses, theme parks, retail and entertainment centers, sports complexes and residential developments.

Science & Biotechnology
The Science and Biotechnology emphasis area is intended for, but not limited to, those students who feel they will go to graduate school and provides these students with a strong foundation in basic sciences. Career opportunities for graduates in this area who complete advanced graduate degrees include teaching and research at universities and private industry research. Graduates with good communication skills may also have career opportunities with consulting firms and the Cooperative Extension Service communicating scientific research findings to the public in an applicable and understandable format. Students graduating with a BS and MS degrees, with research experience and skills, will be very competitive for lab bench positions, but the MS will facilitate promotions to supervisor and leadership positions. In addition to larger companies, there are many smaller companies and start-ups looking for recent biotechnology graduates. Skills in tissue culture and transformation, recombinant DNA and molecular biology, protein and nucleic acid biochemistry, genomics, proteomics, and bioinformatics are particularly useful.

BS HORTICULTURE: Fruit & Vegetable Production & Management

Career Opportunities:
- Orchard Manager
- Vegetable Farm Manager
- Technician or field representative for fruit or vegetable processor
- Federal or state inspector for fruit and vegetables
- Producer of fruits, nuts, vegetables, herbs
- Commercial Seed Producer
- Border, Port and Homeland Security Agents
- Sales or technical representative for seed companies, horticultural supply firms and chemical companies
- Wholesale or retail purchaser/ sales/technical service dealing with fresh or processed fruits and vegetables for chain stores, garden centers, government institutions and wholesale distributors.
- Marketing and Sales Representative of Fruits & Vegetables
- Marketing and Sales Representative of any product associated with the production of fruits and vegetables

Horticulture Specialization Requirements (18 hours required)
These courses are required for this emphasis area:
- HORT 319 Fruit and Nut Production
- HORT 325 Vegetable Crop Productions
- Writing Intensive HORT course (choose from HORT 225 or 315)

Choose the additional hours from the following:
- HORT 301 Garden Science
- HORT 311 Principles of Food Processing
- HORT 404 Plant Breeding
- HORT 418 Nut Culture
- HORT 419 Grape and Small Fruit Culture
- HORT 420 Concepts in Wine Production
- HORT 421 Enology
- HORT 423 Tropical Horticulture
- HORT 428 Commercial Greenhouse Management
- HORT 431 Nursery Production and Management
- HORT 440 International Horticulture
- HORT 446 Commercial Fruit and Vegetable Processing
- HORT 484 Internship
**Study Emphasis Electives (30 hours required)- Choose from the following:**

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<td>AGSM 201 Farm Tractors and Power Units</td>
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<td>AGSM 301 Systems Analysis in Agriculture</td>
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<td>AGSM 335 Water and Soil Management</td>
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<td>AGSM 360 Occupational Safety Management</td>
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<td>AGSM 435 Irrigation Principles and Management</td>
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<td>ALED 340 Survey of Leadership Theory</td>
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<td>ENTO 320 Honey Bee Biology</td>
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<td>ENTO 401 Principles of Insect Pest Management</td>
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<td>ENTO 402 Field-Crop Insects</td>
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<td>ENTO 405 Horticultural and Floricultural Entomology</td>
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<td>MGMT 309 Survey of Management</td>
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<tr>
<td>MKTG 409 Principles of Marketing</td>
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<td>SCSC 422 Soil Fertility and Plant Nutrient Management</td>
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<td>SPAN 101 Beginning Spanish I</td>
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<td>AGEC 344 Food and Agricultural Law</td>
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<td>AGEC 413 Agricultural Cooperatives</td>
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<td>AGCJ 105 Intro to Agricultural Communications</td>
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<td>AGCJ 306 Theory and Practice of Agricultural Public Relations</td>
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<td>AGLS 101 Modern Agriculture Systems and Renewable Natural Resources</td>
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<td>ATMO 201 Atmospheric Science</td>
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<td>COMM 203 Public Speaking</td>
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<td>Computer Course – Choose from: AGLS 201 Computer Applications in Agriculture or INFO 209 Business Information Concepts or RENR 201 Computer Applications in Agriculture</td>
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<td>ENGL 210 Scientific and Technical Writing or ENGL 301 Technical Writing</td>
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<td>FINC 201 Personal Finance</td>
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<td>FSTC 201 Food Science and Technology</td>
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<td>MGMT 105 Intro to Business</td>
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<td>MGMT 209 Business, Government and Society</td>
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<td>MGMT 212 Legal and Social Environment of Business</td>
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<tr>
<td>NUTR 202 Fundamentals of Human Nutrition</td>
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NUTR 203  Scientific Principles of Human Nutrition  
SCSC 105 World Food and Fiber Crops  
SCSC 303 Crop Ecology  
SCSC 435 Ecology of Agricultural Chemicals in Field Crops and Turf  
SCSC 450 Chemical Weed Control and/or SCSC 452 Chemical Weed Control Laboratory  
SCSC 455 Environmental Soil Science and Water Science  
SCSC 465 Crop Management: An Extension Perspective  
RENR 205  Fundamentals of Ecology  

Minors Accepted in:  
Agricultural Economics  
Agronomy  
Business  
Entomology  
Teaching Certification through Agricultural Science or http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46  

BS HORTICULTURE: Nursery/Floral Crop Production & Management  
Career Opportunities:  
Producer of nursery/floral crops, cut flowers, herbs  
Greenhouse Crop Manager  
Wholesale Nursery Manager  
Plant Propagator  
Sales or technical representative for seed companies, horticultural supply firms and chemical companies  
Wholesale or retail purchaser/sales/technical service dealing, cut flowers, nursery/floral crops for chain stores, garden centers, government institutions and wholesale distributors  
Marketing and Sales representative of nursery/floral crops  
Marketing and Sales representative of any product associated with the production of nursery/floral crops  
Retail Garden Center Manager  

Horticulture Specialization Requirements (18 hours required)  
These courses are required for this emphasis area:  
HORT 306 Woody Ornamental Plants or HORT 308 Landscape Plant Materials  
HORT 428 Commercial Greenhouse Management  
HORT 431 Nursery Production and Management  
Writing Intensive HORT course (choose from HORT 225 or 315)  

Choose the additional hours from the following:  
HORT 301 Garden Science  
HORT 306 Woody Ornamental Plants  
HORT 308 Landscape Plant Materials  
HORT 309 Interior Plants  
HORT 404 Plant Breeding  
HORT 423 Tropical Horticulture  
HORT 426 International Floriculture Marketing  
HORT 429 Floriculture Crop Production  
HORT 431 Nursery Production and Management  
HORT 440 International Horticulture  
HORT 451 Retail Floristry  
HORT 484 Internship
Study Emphasis Electives (30 hours required)- Choose from the following:

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<td>FRSC 420 Arboriculture</td>
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<td>FRSC 421 Urban Forestry</td>
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<tr>
<th>BS HORTICULTURE: Nursery/Floral Crop Production &amp; Management (continued)</th>
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<td>MGMT 309 Survey of Management</td>
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<tr>
<td>MGMT 212 Legal and Social Environment of Business</td>
</tr>
</tbody>
</table>
RENR 205 Fundamentals of Ecology
RENR 410 Ecosystem Management
SCSC 302 Recreation Turf and/or SCSC 312 Introductory Turfgrass Management Laboratory
SCSC 435 Ecology of Agricultural Chemicals in Field Crops and Turf
SCSC 450 Chemical Weed Control and/or SCSC 452 Chemical Weed Control Laboratory

Minors Accepted in:
Agricultural Economics
Agronomy
Business
Entomology
Forestry
Teaching Certification through Agricultural Science or http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46

BS HORTICULTURE: Landscape Management
Career Opportunities:
Development and maintenance supervisor of landscapes in parks, recreation areas, residential homes, businesses, estates, botanical gardens, public and private gardens
Landscape supervisor
Lawn and grounds maintenance manager
Landscape contractor
Arborist
Landscape Construction manager
Landscape Installation manager
Botanical gardens research scientist- plant identification and research
Horticulturist in city, state or national parks
Horticulturist in golf courses or other recreational parks
Environmental consultant
Corps of Engineers employee

Horticulture Specialization Requirements (18 hours required)
These courses are required for this emphasis area:
HORT 306 Woody Ornamental Plants
HORT 308 Landscape Plant Materials
HORT 425 Landscape Maintenance and Construction
Writing Intensive HORT course (choose from HORT 225 or 315)

Choose the additional hours from the following:
HORT 309 Interior Plants
HORT 428 Commercial Greenhouse Management
HORT 429 Floriculture Crop Production
HORT 431 Nursery Production and Management
HORT 484 Internship
HORT 489 Urban Plant Ecology
HORT 489 Horticulture Bidding and Sales
HORT 489 Water Management in Urban Landscapes

Study Emphasis Electives (30 hours required)- Choose from the following:
Recommended
Any HORT Course up to 15 hours
The following HORT courses are Highly Recommended: HORT 225 Horticulture Learning Community, HORT 301 Garden Science, HORT 309 Interior Plants, HORT 332 Horticulture Landscape Graphics, HORT 428

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ACCT 209</td>
<td>Survey of Accounting Principles or ACCT 229 Introductory Accounting</td>
</tr>
<tr>
<td>AGEC 105</td>
<td>Intro to Agricultural Economics</td>
</tr>
<tr>
<td>AGEC 314</td>
<td>Marketing Agricultural and Food Products</td>
</tr>
<tr>
<td>AGEC 315</td>
<td>Food and Agricultural Sales</td>
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<tr>
<td>AGSM 201</td>
<td>Farm Tractors and Power Units</td>
</tr>
<tr>
<td>AGSM 301</td>
<td>Systems Analysis in Agriculture</td>
</tr>
<tr>
<td>AGSM 335</td>
<td>Water and Soil Management</td>
</tr>
<tr>
<td>AGSM 435</td>
<td>Irrigation Principles and Management</td>
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<tr>
<td>ALED 340</td>
<td>Survey of Leadership Theory</td>
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<tr>
<td>COSC 253</td>
<td>Construction Materials and Methods I</td>
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<tr>
<td>COSC 254</td>
<td>Construction Materials and Methods II</td>
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<td>ECON 202</td>
<td>Principles of Economics</td>
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<td>Principles of Economics</td>
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<td>ENTO 401</td>
<td>Principles of Insect Pest Management</td>
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<td>ENTO 405</td>
<td>Horticultural and Floricultural Entomology</td>
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<td>ESSM 203</td>
<td>Forest Trees of North America</td>
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<td>FRSC 420</td>
<td>Arboriculture</td>
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<td>FRSC 421</td>
<td>Urban Forestry</td>
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<td>MGMT 309</td>
<td>Survey of Management</td>
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<tr>
<td>MKTG 409</td>
<td>Principles of Marketing</td>
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<tr>
<td>SCSC 302</td>
<td>Recreation Turf and/or SCSC 312 Introductory Turfgrass Management Laboratory</td>
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<tr>
<td>SCSC 422</td>
<td>Soil Fertility and Plant Nutrient Management</td>
</tr>
<tr>
<td>SCSC 450</td>
<td>Chemical Weed Control and/or SCSC 452 Chemical Weed Control Laboratory</td>
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<tr>
<td>SPAN 101</td>
<td>Beginning Spanish I</td>
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<td>SPAN 102</td>
<td>Beginning Spanish II</td>
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<tr>
<td><strong>Other Suitable Electives</strong></td>
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<tr>
<td>ACCT 210</td>
<td>Survey of Managerial and Cost Accounting Principles or ACCT 230 Intro. Accounting</td>
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<td>AGEC 330</td>
<td>Financial Management in Agriculture</td>
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<tr>
<td>AGCJ 105</td>
<td>Intro to Agricultural Communications</td>
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<tr>
<td>AGCJ 306</td>
<td>Theory and Practice of Agricultural Public Relations</td>
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<tr>
<td>AGLS 101</td>
<td>Modern Agri. Systems and Renewable Natural Resources</td>
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<tr>
<td>AGSM 360</td>
<td>Occupational Safety Management</td>
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<tr>
<td>BIOL 301</td>
<td>Taxonomy of Flowering Plants</td>
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<tr>
<td>COMM 203</td>
<td>Public Speaking</td>
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<tr>
<td>CVEN 201</td>
<td>Plane Surveying</td>
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<tr>
<td>ENGL 210</td>
<td>Scientific and Technical Writing or ENGL 301 Technical Writing</td>
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<tr>
<td>FINC 201</td>
<td>Personal Finance</td>
</tr>
<tr>
<td>GIS Course</td>
<td>Choose from: AGSM 461 Geographic Information Systems for Resource Management or ESSM 351 Geographic Information Systems for Resource Management or RENR 405 GIS for Environmental Problem Solving</td>
</tr>
<tr>
<td>LAND 329</td>
<td>Landscape Construction I</td>
</tr>
<tr>
<td>MGMT 105</td>
<td>Intro to Business</td>
</tr>
<tr>
<td>MGMT 209</td>
<td>Business, Government and Society</td>
</tr>
<tr>
<td>MGMT 212</td>
<td>Legal and Social Environment of Business</td>
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</table>
RENR 205 Fundamentals of Ecology
RENR 410 Ecosystem Management
SCSC 428 Advanced Turf Ecology and Physiology
SCSC 429 Turf Management Systems
SCSC 430 Turfgrass Maintenance
SCSC 435 Ecology of Agricultural Chemicals in Field Crops and Turf
SCSC 455 Environmental Soil Science and Water Science

**Minors Accepted in:**
- Agricultural Economics
- Agronomy
- Business
- Entomology
- Forestry
- Teaching Certification through Agricultural Science or [http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46](http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46)

**BS HORTICULTURE: Science and Biotechnology**

**Career Opportunities:**
Research scientist or technician at a university, government agency or lab (USDA, NSF, germplasm resource centers)
Industry research scientist (agrochemical, pharmaceutical, food, seed and nursery)
Professor, lecturer, instructor or teacher in a college or university, K-12 or museums, parks, nature centers
Science writing and communication
Science advisor for patent law, public policy, lawmakers

**Horticulture Specialization Requirements (18 hours required)**

These courses are required for this emphasis area:
Hor 491 Research (Research in Faculty Lab) *Must enroll in course 1 year prior to anticipated graduation date*

Writing Intensive HORT course (choose from HORT 225 or 315)

**Choose the additional hours from the following:**
Hor 306 Woody Ornamental Plants
Hor 308 Landscape Plant Materials
Hor 311 Principles of Food Processing
Hor 319 Fruit and Nut Production
Hor 325 Vegetable Crop Production
Hor 418 Nut Culture
Hor 419 Grape and Small Fruit Culture
Hor 421 Enology
Hor 423 Tropical Horticulture
Hor 429 Floriculture Crop Production
Hor 431 Nursery Production and Management
Hor 440 International Horticulture
Hor 446 Commercial Fruit and Vegetable Processing
Hor 484 Internship
Hor 489 Urban Plant Ecology
### Study Emphasis Electives (30 hours required)- Choose from the following:

<table>
<thead>
<tr>
<th>Recommended</th>
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<tbody>
<tr>
<td>Any HORT Course up to 15 hours</td>
</tr>
<tr>
<td>The following HORT courses are Highly Recommended: HORT 225 Horticulture Learning Community, HORT 306 Woody Ornamental Plants, HORT 308 Landscape Plant Materials, HORT 311 Principles of Food Processing, HORT 319 Fruit and Nut Production, HORT 325 Vegetable Crop Production, HORT 418 Nut Culture, HORT 419 Grape and Small Fruit Culture, HORT 421 Enology, HORT 423 Tropical Horticulture, HORT 429 Floriculture Crop Production, HORT 431 Nursery Production and Management, HORT 440 International Horticulture, HORT 446 Commercial Fruit and Vegetable Processing, HORT 484 Internship, HORT 489 Urban Plant Ecology</td>
</tr>
<tr>
<td>AGCJ 105 Intro to Agricultural Communications</td>
</tr>
<tr>
<td>AGLS 105 Research in Agriculture and Life Sciences</td>
</tr>
<tr>
<td>AGLS 125 Life Sciences Learning Community I</td>
</tr>
<tr>
<td>ALED 340 Survey of Leadership Theory</td>
</tr>
<tr>
<td>BICH: Any Biochemistry Course (example, BICH 410/411 Comprehensive Biochemistry)</td>
</tr>
<tr>
<td>CHEM: Any Chemistry Course</td>
</tr>
<tr>
<td>ENGL 210 Scientific and Technical Writing or ENGL 301 Technical Writing</td>
</tr>
<tr>
<td>ENTO 315 Biotechnology and Society</td>
</tr>
<tr>
<td>GENE/MEPS 411 Biology for Crop Improvement</td>
</tr>
<tr>
<td>GENE: Any Genetics Course (example, GENE 450 Introduction to Genomics)</td>
</tr>
<tr>
<td>PHYS: Any Physics Course</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Suitable Electives</th>
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</thead>
<tbody>
<tr>
<td>STAT 302 Statistical Methods</td>
</tr>
<tr>
<td>AGCJ 203 Agricultural Media Writing I</td>
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<tr>
<td>AGCJ 306 Theory and Practice of Agriculture Public Relations</td>
</tr>
<tr>
<td>AGLS 101 Modern Agri. Systems and Renewable Natural Resources</td>
</tr>
<tr>
<td>AGSM 461 GIS for Resource Management</td>
</tr>
<tr>
<td>BESC 201 Intro to Bioenvironmental Sciences</td>
</tr>
<tr>
<td>BESC 314 Pathogens, the Environment and Society</td>
</tr>
<tr>
<td>BIOL 111 and 112 Introductory Biology</td>
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<tr>
<td>BIOL 206 Microbiology</td>
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<tr>
<td>BIOL 213 Molecular Cell Biology</td>
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<tr>
<td>BIOL 281 Seminar in Quantitative Biology</td>
</tr>
<tr>
<td>BIOL 301 Taxonomy of Flowering Plants</td>
</tr>
<tr>
<td>BIOL 328 Plants and People</td>
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<tr>
<td>BIOL 330 Molecules &amp; Life</td>
</tr>
<tr>
<td>BIOL 401 Critical Writing in Biology</td>
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<tr>
<td>BIOL 451 Bioinformatics</td>
</tr>
<tr>
<td>COMM 203 Public Speaking</td>
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<tr>
<td>COMM 205 Communication for Technical Professions</td>
</tr>
<tr>
<td>Computer Course – Choose from: AGLS 201 Computer Applications in Agriculture or INFO 209 Business Information Concepts or RENR 201 Computer Applications in Agriculture</td>
</tr>
<tr>
<td>EHRD 479 Grants and Contracts</td>
</tr>
<tr>
<td>ENGL 210 Scientific and Technical Writing or ENGL 301 Technical Writing</td>
</tr>
<tr>
<td>ENGL 320 Technical Editing and Writing</td>
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<tr>
<td>ENTO 405 Horticultural and Floricultural Entomology</td>
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<tr>
<td>FINC 201 Personal Finance</td>
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<tr>
<td>FSTC 201 Food Science</td>
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<tr>
<td>GEOG 435 Principles of Plant Geography</td>
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<td>Course Code</td>
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<tr>
<td>GEOS 411</td>
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<td>NUTR 202</td>
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<td>NUTR 203</td>
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<td>PHIL 314</td>
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<td>RENR 205</td>
</tr>
<tr>
<td>SCSC 303</td>
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<tr>
<td>SCSC 465</td>
</tr>
</tbody>
</table>

**Minors Accepted in:**
- Agricultural Communications and Journalism
- Agronomy
- Biochemistry
- Bioenvironmental Sciences
- Chemistry
- Entomology
- Genetics

Teaching Certification through Agricultural Science or [http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46](http://www.science.tamu.edu/cmse/mass/content.php?id_dir=46)
Appendix 2.3 - Horticultural Sciences Undergraduate Student Handbook

Introduction
Horticulture is a continually growing profession full of challenging, rewarding, and enjoyable careers. Horticulture encompasses the art, science, and technology of production, utilization, and distribution of fruits, vegetables, and nursery/floral crops throughout all facets of our society. The undergraduate program focuses on traditional areas of production, marketing, and processing of horticultural crops. In addition, horticultural programs in urban areas have added social sciences, creativity and design. Students are provided with technical and scientific skills as well as communication, leadership, and interpersonal capabilities necessary to function effectively as horticultural professionals.

The purpose of this handbook is to provide information about the undergraduate program in horticulture so that you can get the greatest benefit during your studies at Texas A&M University. There are many programs and agencies available to assist you, offer opportunities, and help you solve problems during your stay at Texas A&M University. We hope this manual will help you to better understand our program, and encourage you to use the many services available.

Each year a revised edition of the Texas A&M University Undergraduate Catalog is available at (http://catalog.tamu.edu/). This Undergraduate Handbook for the Department of Horticultural Sciences does not replace the Undergraduate Catalog and is intended to supplement the catalog with information specific to the Department of Horticultural Sciences. Each student should be familiar with the Undergraduate Catalog (http://catalog.tamu.edu/) at Texas A&M University and has the responsibility to be fully acquainted with and to comply with the Texas A&M University Student Rules (http://student-rules.tamu.edu/). Read the materials carefully and do not hesitate to seek help if you have questions.

We are happy that you are here! We hope that your experiences in the Department of Horticultural Sciences, both personally and professionally, will meet all of your expectations, and we wish you the best for a great educational experience!

People Who Can Help and Where to Find Them

Undergraduate Advising Office
Texas A&M University
Department of Horticultural Sciences
204 Horticulture/Forest Science Building
College Station, TX 77843-2133
Phone (979) 862-3116  Fax (979) 845-0627
http://hortsciences.tamu.edu/

***This office is your first stop if you are enrolling in the Department for the first time. We will help plan your first class schedule, evaluate transfer credits for use within the department, and work up a preliminary degree plan.***

| Katie Marek, Senior Academic Advisor | Debbie Perez, Academic Advisor |
| HFSB 204B / 979.862.3116 | HFSB 204C / 979.845.5343 |
| ktmarek@tamu.edu | Debbie.Perez@ag.tamu.edu |

| Additional Departmental Contacts | Dr. Leo Lombardini |
| Dr. Dan Lineberger, Department Head | Professor & Internship Coordinator |
| HFSB 202 / 979.845.5278 | 979.458.8079 |
| dan-lineberger@tamu.edu | l-lombardini@tamu.edu |

| Marissa Faris, Experiential Education Program Coordinator | 979.845.6068 |
| mfaris@tamu.edu | |

| Academic Dean's Office, College of Agriculture and Life Sciences, | * |
| 515 Agriculture and Life Sciences Building (AGLS), College Station, TX 77843 | * |
| Phone (979) 845-3712 | * |
| http://aglifesciences.tamu.edu/ | * |

| Dr. Kim Dooley | Dr. Chris Skaggs |
| Associate Dean for Academic Operations | Associate Dean for Student Development |
| k-dooley@tamu.edu | cskaggs@tamu.edu |

| Dr. Danielle Harris |  |
| Assistant Dean for Student Success |  |
| danielleh@tamu.edu |  |
Faculty
One of the greatest assets in the Department of Horticultural Sciences is our devoted, caring and knowledgeable Faculty. As students enter the Department, they are encouraged to interact with our Faculty who will guide them throughout their academic career. They may advise students in their areas of expertise and are trained to be effective referral sources to other Texas A&M University services for specific problems or concerns. Faculty members can be a nonjudgmental ear for students to talk with about topics including: career choices, graduate school, internships, finding a job, academic burnout, course selection advice, joining social activities, letters of recommendation, and much more.

The following information can aid you in finding faculty members working in areas specific to your interests. Current contact information is also available at: http://hortsciences.tamu.edu/faculty/index.html

Faculty Members and Resources for Emphasis Areas

<table>
<thead>
<tr>
<th>RM:</th>
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<tbody>
<tr>
<td>Dr. Michael Arnold - Landscape Horticulture</td>
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<tr>
<td>Dr. David Byrne - Fruit and Nut Production</td>
<td>428</td>
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<tr>
<td>Dr. Luis Cisneros - Food Sciences</td>
<td>511</td>
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<tr>
<td>Dr. Gregory Cobb - Plant Physiology</td>
<td>525</td>
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<td>Dr. Kevin Crosby – Plant Breeding</td>
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<td>Dr. Fred Davies - Nursery Production</td>
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<td>Dr. Tim Davis – Ornamental Production</td>
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<td>Dr. Charles Hall – Ornamental Production 222</td>
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<td>Mr. James Johnson - Retail Floristry</td>
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<tr>
<td>Mr. Matt Kent – Ornamental Production 407</td>
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<tr>
<td>Dr. Patricia Klein – Plant Genomics (Borlaug Center)</td>
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<tr>
<td>Dr. Hisashi Koiwa – Plant Physiology</td>
<td>522</td>
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<tr>
<td>Dr. Dan Lineberger – Technology</td>
<td>507</td>
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<tr>
<td>Dr. Leo Lombardini – Fruit &amp; Nut Production</td>
<td>426</td>
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<tr>
<td>Dr. George Ray McEachern – Grapes &amp; Wine</td>
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<tr>
<td>Mr. Bill McKinley - Floral Design/Event Plan.</td>
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<tr>
<td>Dr. Creighton Miller – Plant Breeding</td>
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<tr>
<td>Dr. Bhum Patil – Plant Breeding (Centeq Bldg.)</td>
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<tr>
<td>Dr. Betsy Pierson -Plant-Microbe Interaction</td>
<td>427</td>
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<tr>
<td>Dr. David Reed - Ornamental Production 408</td>
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<tr>
<td>Dr. Terri Starman - Ornamental Production</td>
<td>424</td>
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<tr>
<td>Dr. Astrid Volder – Landscape Ecology</td>
<td>405</td>
</tr>
<tr>
<td>Dr. Jayne Zajicek - Urban Horticulture</td>
<td>422</td>
</tr>
</tbody>
</table>

Working with Faculty
Our Faculty and the Undergraduate Advising Office are dedicated to serve you and help you with your educational goals. In most cases, a scheduled meeting is the preferred method to meet with the Horticulture Faculty as well as other Professors for your courses. Once you have an appointment, please follow these guidelines to make the most of your meeting.

- Give thoughtful consideration to your personal, educational, and career goals.
- Become familiar with your own academic program including all applicable requirements and policies.
- Accept responsibility for your choices and decisions.
- Ask questions if you do not understand.
- Be on time to all scheduled appointments, and try to be organized so you can make the best use of everyone's time.
- Listen to your advisor and faculty rather than well-meaning friends and acquaintances when it comes to your academic progress.
- Keep your address and telephone numbers updated with your advisor and the Records Section of the Registrars Office (845-1031). You may update your own information on HOWDY (https://howdy.tamu.edu ).

Degree Plan
The degree plan is the framework of courses that a student is required to complete for their degree in the Department of
Horticultural Sciences. Each degree plan is unique to the student’s individual career goals and is developed by the student, in conjunction with the Advising Worksheets, staff advisors and the Faculty. Advising Worksheets for each “Emphasis Area” are presented on the following pages. The following sections include components of the degree plan that are common for all horticultural sciences students.

UNIVERSITY CORE CURRICULUM
The core curriculum requirements are set by the Faculty Senate and are required of all students attending Texas A&M University. To be sure that your program is in accordance with the core curriculum, check the Undergraduate Catalog (http://catalog.tamu.edu/) for the core curriculum requirements in the year that you entered the University, or a more recent year. Ask your advisor what catalog might be best for your circumstances.

The University Core Curriculum also requires that each student earn two years of high school foreign language credit before attending TAMU, or take two semesters of foreign language at the university level. Students seeking the BA degree have an additional language requirement and should ask an advisor for details.

HORTICULTURAL SCIENCE & SUPPORTING FIELD REQUIREMENTS
The courses listed under these categories on the degree plans are required of all horticulture students seeking a BS or BA degree. Courses transferred from other universities must be approved by the Department Head of the Department of Horticultural Sciences and in some cases, by the instructor of the comparable course taught at TAMU.

HORTICULTURE SPECIALIZATION REQUIREMENTS
Students will be required to complete certain Horticulture electives based in the “Emphasis Area” he/she selects. Additional HORT electives will be chosen from approved electives on the Advising Worksheets.

STUDY EMPHASIS ELECTIVES
The study emphasis allows you to choose a block of technical electives, both inside and outside the Department of Horticultural Sciences, which will best support your career goals. Once a student selects an “Emphasis Area”, electives will be chosen from approved electives on the Advising Worksheets. Horticulture courses used in the Study Emphasis area may not exceed 15 hours of the total hours of these electives. A student may petition the use of additional courses not included on the Advising Worksheet by completing an Appeal Form for “Study Emphasis Electives”. It is highly advised that the student submit this paperwork prior to taking the course to guarantee that the course will be acceptable towards their degree plan. (see the last paragraph on page 6 for procedure)

Experiential Learning
The Department of Horticultural Sciences strongly recommends that horticulture majors enroll in Experiential Learning coursework. These opportunities allow students to gain course credit applicable towards the degree plan and to ‘learn by doing’. Experiential learning programs include Internships, Study Abroad Programs, Undergraduate Research, Service Learning, and Honors coursework.

To learn about experiential learning options, visit http://hortsciences.tamu.edu/experiential-learning/ or speak with the Experiential Education Program Coordinator:
Marissa Faris
Experiential Education Program Coordinator
HFSB 509/ 979.845.6068
mfaris@tamu.edu

PROFESSIONAL INTERNSHIPS
Professional Internships provide students with the chance to gain field-related work experience while at the same time trying out a potential career path and/or prospective employer. In addition, internships allow students to put what they learn in class into practice.

Internship opportunities abound; TAMU students have interned nationally and internationally. Public gardens, private landscape and retail firms, non-profit organizations, growers, florists, designers, and tree care companies are just a few of the places with which students can intern.

Although many students choose to intern in the summer months, there are opportunities year-round. Enrollment in HORT 484 allows students to receive academic credit and provides access to the Internship Coordinator who will help ensure an educational component in your internship. If you are interested in an internship, contact the Experiential
Learning Program Coordinator or the faculty Internship Coordinator, Dr. Leo Lombardini. More information and the complete internship packet are available at http://hortsciences.tamu.edu/experiential-learning/experiential-learning/internships2-2/

Dr. Leo Lombardini  
Faculty, Internship Coordinator  
HFSB 426 / 979.458.8079  
l-lombardini@tamu.edu

STUDY ABROAD
Study abroad programs give students a first-hand view of another country and culture. With today’s global economy, an international perspective is more important than ever before for those entering the workforce. Students can earn core curriculum credit, elective credit, internship/research credit, or transfer credit from a foreign university depending on the details of the program.

Study abroad opportunities are available for all students and can last from a week to a year. With good planning, study abroad can help you gain valuable international experience while completing your degree on time. Funding resources are available, both through the Department of Horticultural Sciences and through the Study Abroad Programs Office.

Not sure if you want to study abroad? Talk to students who have done it. An active study abroad mentor program is available to help you make your decision and begin planning. Speak with the Experiential Learning Program Coordinator or visit http://hortsciences.tamu.edu/experiential-learning/experiential-learning/study-abroad/ to get started.

UNDERGRADUATE RESEARCH & DIRECTED STUDIES
Undergraduate Research and Directed Studies enable the student to form special working relationships with faculty members within the department and, at the same time, gain valuable learning experiences. The student is responsible for contacting the faculty member that she or he wishes to work with, and together they must fill out the HORT 491 or 485 contract form available from the Advising Office (HFSB 204).

HORT 491 (Undergraduate Research) allows students to gain hands-on experience in plant science and laboratory methods while working on a research project. Students may have the opportunity to travel to scientific meetings to present their findings.

HORT 485 (Directed Studies) allows students to work with the guidance of a faculty member to gain further knowledge in a particular area of Horticulture while participating in special projects.

Curriculum in Horticultural Sciences
The Department of Horticultural Sciences offers a Bachelor of Science and a Bachelor of Arts degree in Horticulture. These degrees include 6 emphasis areas described in the following pages. Graduates in all emphasis areas are prepared for graduate studies in horticulture and other plant related sciences, as well as other academic areas including but not limited to; agricultural business, teacher certification and landscape architecture.

CHOOSING AN EMPHASIS AREA AND SUITABLE ELECTIVES
The following pages include the most current TAMU Catalog Degree Plans for the Department of Horticultural Sciences along with the approved electives for the "Horticulture Specialization Requirements" and the "Study Emphasis Electives" for each of our six Emphasis Areas. The Advising Worksheets were developed by Departmental Faculty and Staff to insure students select the proper coursework to meet their career objectives.

* Read the Emphasis Area Advising Worksheets thoroughly to help select the Emphasis Area most suited to your career goals.
* Discuss career objectives with your staff advisors and Faculty to help aid in your career decision.
* Register for courses suited to your classification. For example, freshman and sophomores should concentrate on required Core Curriculum courses as well as 100-200 level courses in HORT. Always refer to the most current TAMU catalog (http://catalog.tamu.edu/) for current course descriptions and prerequisites to insure your success.
* If you are undecided about which Emphasis Area is best for you, choose courses that are required for all majors or electives that apply to all Emphasis areas. For example, INFO 209 (Business Information Concepts) applies
as an elective for most Emphasis Areas. Ask a HORT Advisor if you have problems choosing suitable electives.

- If an Emphasis Area looks appealing, choose a "Highly Recommended" HORT course from that Advising Worksheet to learn more about the subject. Ask a HORT Advisor which courses may point you in the right direction.

- Once a student has completed 45 credit hours, selecting an Emphasis Area is strongly suggested. Students must complete an “Emphasis Area” form so that elective courses may be loaded into the student’s degree plan audit available at https://howdy.tamu.edu/.

- If you find a course that you would like to enroll in but it is not included on the Advising Worksheet for your Emphasis Area, you may file an appeal. Students will complete a simple form including the reason that the course relates to your emphasis area and should be considered as a “Study Emphasis Elective”. Appeals will be due on or before October 15th or February 15th and students will be notified by their NEO email no later than November 1st or March 1st, respectively. Once the appeal is granted, the elective course will be applied as a “Study Emphasis Elective” on the student’s degree plan. It is highly advisable to file the appeal form before taking the course.

Second Degrees, Double Majors, and Minors

Students at Texas A&M University have the option of seeking second degrees, double majors, and minors. These programs enable students to gain valuable information in more than one academic department, and gain University recognition on the transcript and/or diploma. Students majoring in Horticulture may pursue these options in other Departments. Interested students should consult with the academic advisor in the Department that they wish to seek a second degree, double major, or minor from about the requirements of the program.

SECOND DEGREE

A **second degree** is awarded to students who have completed all of the requirements for two separate degrees. A candidate pursuing a second degree will receive two separate degrees and diplomas (i.e., two BS degrees, or a combination of two degrees, such as a BS and a BA). Students who have pursued second degrees in horticulture have commonly come from majors within the College of Agriculture and Life Sciences; however, students from other colleges are also eligible to apply.

DOUBLE MAJOR

A candidate for a **double major** receives one degree (i.e., BS), with both majors indicated on the diploma. A double major usually requires less total course work than a second degree, and it may be integrated, as electives, in the student degree plan. This program is designed to give a student an excellent background in another related field of study.

Students currently enrolled at TAMU must receive approval for the second degree or double major before the student reaches senior standing. Students pursuing a second degree or double major in horticulture must be in good academic standing, with a GPR of 2.0 or above.

MINOR

Horticulture students may also pursue a **minor**. The minor program provides a concentration of study in another scholastic department, and is recognized on the transcript after graduation, but not on the diploma. Classes taken for a minor may count as **Study Emphasis Electives**, depending on the Emphasis Area selected by the student. Minor requirements include a minimum of 15-18 hours of course work in a Department, of which at least 9 must be 300-400 level. **Students interested in pursuing a minor should contact an advisor in that department, and proceed with the necessary paperwork.** Minor requirements may be viewed at: [http://unst.tamu.edu/minors.aspx](http://unst.tamu.edu/minors.aspx)
Dates, Deadlines, and Policies

FULL-TIME STATUS

- Twelve hours or more is considered a full-time load. Part-time students (those taking 1-11 semester credit hours) will be charged tuition and fees based on the number of hours they take, plus course fees and other fees charged on a fixed rate per semester basis. Full-time undergraduate students (those taking 12 semester credit hours or more) will be charged a flat rate for designated tuition regardless of the number of hours taken. Students are encouraged to take at least 15 semester credit hours to receive full value under the flat rate policy and will benefit from significant savings for hours in excess of 15.

- A student who drops below 12 hours in a given semester may become ineligible for certain campus activities (i.e., Corps of Cadets, athletics, fraternity or sorority pledging, campus or college organizations); become ineligible for scholarships, financial aid, loans, campus housing (must carry a minimum of nine hours), or be dropped from your family insurance and/or Social Security or Veteran’s benefits. You may also fall behind the pace required to graduate in four years.

TRANSFER CREDIT

Many students transfer into the Department of Horticultural Sciences from other curricula at Texas A&M University or from other colleges or universities. Guidelines for the acceptance of credits earned in other program(s) include:

- Once a student has selected an “Emphasis Area” he/she may use the designated Advising Worksheet to determine if the transfer course credit is appropriate for their degree plan. If a student has taken a course not included on the Advising Worksheet the student may submit an Appeal Form to have the course considered for inclusion on the degree plan. (see page 6 for details)

- Credits earned within the TAMU system will be evaluated by TAMU course number. Students will receive credit on courses with a grade of “D” or above.

- Students will receive credit on courses with a grade of “C” or above when transferred from institutions outside of TAMU.

- Courses transferred by number from institutions outside the TAMU system are considered the equivalent of the numbered courses at TAMU.

- Courses transferred by title from institutions outside the TAMU system either have no comparable course at TAMU or an evaluation to determine which course is comparable has not been made by the department offering the course. The advising staff and the Department Head will determine whether, and how, these courses can be used in the degree plan. In many cases, that student will need to discuss the course with the instructor of a comparable course at TAMU.

- As a general rule, only horticulture courses that transfer in by number or where a 2+2 agreement has been developed will be accepted within the Department. Approval of any other horticulture courses must be determined by the comparable course instructor in the Department of Horticultural Sciences. A letter verifying equivalent course work must be submitted to the Advising Office (HFSB 204).

- Grades from transfer courses from other colleges and universities are not included into your grade point average at Texas A&M University.

- A minimum of 36 semester hours of 300 and/or 400 level course work must be successfully completed in residence at Texas A&M University to obtain a baccalaureate degree. A minimum of 12 of these 36 semester hours must be in Horticulture.

CO-ENROLLING

It is very common for students to co-enroll at TAMU and Blinn College. It is the responsibility of the student to meet all of the admission requirements, course prerequisites and procedures of Blinn College (http://www.blinn.edu).

If you plan to take courses at another community college, equivalent course numbers may be found under the “Course Matrix” on the Texas Common Course Numbering System website (http://www.tccns.org).

CHANGING YOUR MAJOR

For many reasons, a TAMU student may wish to change from one curriculum to another. After consultation with his/her advisor, a student should initiate a change of curriculum by scheduling an appointment with an advisor in the new college or department. Students in good academic standing, with a GPA of 2.0 or higher, may be permitted to transfer into the Horticulture Department.
First semester freshmen may initiate a curriculum change through the fifth day of the semester. After the fifth class day, no curriculum change will be considered until after the end of the semester.

New transfer students cannot change majors until final grades are recorded after completion of the first spring or fall semester at TAMU.

A student in good academic standing (based on the receiving college’s requirements) may initiate a curriculum change during the semester no later than the last day of Q-drops.

Five days after final grades are available, curriculum changes may once again be initiated for all students. (See Rules and Regulations.)

**ADDING/ DROPPING A COURSE OR ENROLLING FOR THE TERM:**

- Adding/Dropping a class is permitted during the first 5 class days during Fall/Spring.
- Adding/Dropping a class is permitted during the first 4 class days during summer semesters.
- A student requesting to add a course after these deadlines must have the approval of the student’s dean and department.

**Q-DROP POLICY (CHANGES EFFECTIVE 2013-2014)**

**CURRENT POLICY**

- Allowed through the 50th day of classes during Fall/Spring.
- Allowed through the 15th day of classes during summer semesters.
- Student completes form requesting Q-drop and receives approval from the Department (HFSB 204). The form is processed by the HORT Advising Office. This form is available at: [http://registrar.tamu.edu/forms/Q-Drop_Form.pdf](http://registrar.tamu.edu/forms/Q-Drop_Form.pdf)
- The course will appear on your transcript with the designation “Q”. A Q-drop does not affect grade point ratio.
- No money will be refunded.
- You are allowed only THREE (3) Q-drops during your undergraduate studies at TAMU.

**REVISED POLICY (PLANNED CHANGES FOR 2013-2014, EFFECTIVE 5:00 P.M., FRIDAY, AUGUST 23, 2013)**

- Extended to the 60th day of classes during Fall/Spring
- Allowed FOUR (4) Q-drops during your undergraduate studies at TAMU.

**FIRST YEAR GRADE EXCLUSION POLICY (TERMINATED AFTER 2012-2013)**

A fully admitted, currently enrolled Texas A&M undergraduate student as defined by the Texas Higher Education Coordinating Board as "first time in college" may elect to exclude from his/her undergraduate degree and cumulative GPR calculation grades of D, F, or U. This exclusion shall be permitted for up to a maximum of three courses taken for credit at Texas A&M University during the twelve month period beginning with the student's initial enrollment at Texas A&M University.

Information on this policy is available at: [http://registrar.tamu.edu/Current/GradeExPolicy.aspx](http://registrar.tamu.edu/Current/GradeExPolicy.aspx)

**IMPORTANT: First Year Grade Exclusions (FYGE) are being terminated after the 2012-2013 Academic Year. FYGE termination is in effect the last work day before fall semester begins in 2013, 5:00 p.m., Friday, August 23, 2013.**

**SCHOLASTIC PROBATION AND SUSPENSION**

Scholastic Probation will occur in any semester that your GPR drops below 2.0. Student Rules [http://student-rules.tamu.edu/](http://student-rules.tamu.edu/) contains definitions and procedural outlines for matters like “scholastic deficiency,” “scholastic probation,” and other related matters upon which these guidelines are based.

A grade point deficiency is calculated by determining the number of grade points below a C average (below a 2.0). The following formula is used to calculate your grade point deviation from a C average:
Using HOWDY Terminology → “QUALITY POINTS” - “GPA HOURS” * 2  

\[ \text{GRADE POINT DEVIATION FROM A C AVERAGE} = (\text{TOTAL GRADE POINTS EARNED}) - (\text{TOTAL CREDIT HRS. ATTEMPTED} \times 2) \]

The following rules apply to students who are on probation while majoring in Horticulture:

- A student whose grade point average falls below a 2.0 will be on academic probation the following semester or summer term.
- A registration block will be placed on a student who is on scholastic probation.
- The student will be notified in writing that he/she has been placed on academic probation, and will be required to have a conference with the Department Head to discuss probationary conditions before continuing at TAMU in the Department of Horticultural Sciences.
- The student will be notified in writing of the conditions of his/her probation, as discussed during the conference with the Department Head.
- A student on probation who fails to meet her or his probationary requirements as set by the Associate Department Head for Undergraduate Programs, may be suspended from the Department of Horticultural Sciences for the following semester. The student may have the option to apply for readmission to the Department after his/her probationary term has expired.
- If special circumstances warrant, exceptions may be made to these policies. Appeals to these policies should be made first through the Department Head. If the issue has not been resolved satisfactorily, at that point, the appeal should be made to the Associate Dean of the College of Agriculture and Life Sciences.

**REGISTRATION BLOCKS**

Registration blocks prevent you from registering for the next semester. Many offices at TAMU can block you from registering. Only the program that put the registration block in the computer can remove it.

For example, registration blocks are used in the Horticultural Sciences Department when a student is on academic probation. Lifting or removing a block to allow registration activity can only be done by meeting with the Department Head or advising staff. You may check for blocks at Howdy (https://howdy.tamu.edu)

**WITHDRAWAL**

- Students are responsible for personally withdrawing from the University.
- It is recommended that you talk with your professors before withdrawing.
- The last date to withdraw from the University is the last day of the Q-drop period.
- No student will be allowed to withdraw from the University after final exams begin.
- To withdraw from the University, you must obtain the appropriate form and signature from the Dean’s Office (AGLS 515). Procedures are available at: http://registrar.tamu.edu/Current/Withdrawal.aspx
- The student’s department, the student’s Dean’s Office, or professors cannot withdraw a student from the University. Should mitigating circumstances arise and the student is unable to “personally” withdraw from the University, the University Department of Student Affairs (979-845-5262) should be contacted for the correct steps.

**TUITION CHARGED FOR EXCESS CREDIT HOURS**

Texas A&M University will charge tuition at the non-resident rate to all students who exceed the semester credit hour limit for their program. Excess semester credit hours are those which accrue after the student exceeds by 30 hours the number of semester credit hours required for the completion of the degree program in which the student is enrolled. Thus, the student may accumulate up to 30 hours beyond those required for the chosen degree program and not exceed the limitation.

Information on this policy is available at: http://registrar.tamu.edu/General/ExcessCredHr.aspx

**THIRD REPEAT SUPPLEMENTARY FEE**

A non-repeatable course that is attempted by a student more than twice at a public institution of higher education in Texas may not be reported for state funding. As a result, the institution must either pass the non-funded portion to all students, or charge a supplementary fee to the student who is repeating the course. Texas A&M University has chosen to assess a supplementary fee to only those students repeating the course more than twice.
A student attempting certain courses more than twice at Texas A&M University will be subject to a supplementary fee of $125 per semester credit hour ($375 for a 3 hour course) for the repeated course, in addition to tuition and required fees associated with the course.

Information on this policy is available at: http://registrar.tamu.edu/General/ThreePeat.aspx

Department of Horticultural Sciences Undergraduate Clubs

TAMU HORTICULTURE CLUB
The Horticulture Club enables members to increase their knowledge and skills in many areas of horticulture while enhancing people skills and positive work attitudes. It provides opportunities to meet people within the department, industry and profession. The Horticulture Club is a great place to meet new friends, gain experience, and have a lot of fun. Members also may pursue an optional path toward Master Gardener certification. The TAMU Horticulture Club is a growing organization and would love to have you as a member. The club meetings and announcements are posted on the departmental bulletin boards, banners in the Atrium, and their web site (http://hortclub.tamu.edu/).

STUDENT CHAPTER OF THE AMERICAN INSTITUTE OF FLORAL DESIGNERS (SAIFD)
This organization’s primary functions are in floral design. Any student with an interest in floral design may join. Students sponsor speakers, attend field trips, and participate in special programs of the Benz School of Floral Design. SAIFD participates in several social activities each semester, and holds meetings each month. SAIFD earns its funds, and members acquire vital hands-on design experience, by doing floral arrangements for other organizations on campus, by decorating area homes for the Christmas holidays, and by special floral sales. More details can be found at http://aggie-horticulture.tamu.edu/saifd/Welcome.html

PI ALPHA XI
This organization is the national floriculture and ornamental horticulture honor society. Members invited to join must have at least a junior standing and have a minimum GPR of 3.25. The organization promotes at least one major project each year. Among its activities is an annual initiation event.

SUSTAINABLE AGRICULTURE STUDENT ASSOCIATION (SASA)
The Sustainable Agriculture Student Association (SASA) is a student organization formed to unify a body of volunteers and foster an experiential learning community to expose students to aspects of local and organic agriculture in conjunction with the Howdy! Farm. The association accomplishes this goal by creating educational opportunities for those individuals interested in sustainable agriculture. The Howdy Farm currently sees around 350 students a semester from a combination of volunteer students and courses offering credit for service. Students involved with the farm come from various colleges and backgrounds. Learn more at http://studentfarm.tamu.edu

Special Programs

HORTICULTURAL SCIENCES DEPARTMENT SCHOLARSHIPS
A large number of scholarships are available to Horticulture students. These scholarships are usually awarded at the Departmental Annual Awards Banquets held on Parent’s Weekend each spring. Students apply using the University Continuing Student Scholarship Application. You may obtain application forms from the following website: https://scholarships.tamu.edu/. Application deadline for these scholarships is February 1.

The William C. Welch Landscape Horticulture Scholarship has a separate application found at http://hortsciences.tamu.edu/undergraduate-programs/scholarships-financial-aid/. Application deadline for this scholarship is also Feb. 1.

COLLEGE OF AGRICULTURE AND LIFE SCIENCES SCHOLARSHIPS
The College of Agriculture and Life Sciences offers scholarships to qualified students. Students apply using the University Continuing Student Scholarship Application. You may obtain application forms from the following website: https://scholarships.tamu.edu/. Application deadline for these scholarships is February 1.

UNIVERSITY HONORS PROGRAM
The Honors Programs at Texas A&M University challenges promising students to participate in an intellectual community of life-long learners who excel academically, advance knowledge through research, and pursue cultural understanding through international experiences. Incoming freshmen apply to the University Honors Program by December of their senior year in high school. Continuing students at Texas A&M may also apply to the University Honors Program up until they have completed 60 hours at TAMU. Any continuing student with a 3.5+ cumulative GPR may register for Honors courses, but only students admitted to the University Honors Program or those participating in college or departmental Honors tracks have access to resources such as specialized advising, Honors Priority Registration, Honors Course Contracts, etc. Honors courses are noted in the Schedule of Courses with the designation of 200-series section numbers for the fall and spring semesters. A list of available Honors courses for each semester is available by searching the schedule of courses in Howdy by the Honors course attribute. Honors and Undergraduate Research also provides opportunities for all students to get involved with research and other hands-on learning opportunities. For more information go to: (http://honors.tamu.edu).

**SUPPLEMENTAL INSTRUCTION**

Texas A&M University’s Supplemental Instruction (SI) program targets traditionally difficult core curriculum courses, and provides regularly scheduled, out-of-class study sessions. The SI sessions are led by undergraduate students who have taken the course and been trained in pro-active learning and study strategies. The SI leaders attend all course lectures, take notes, and read the assigned materials. They serve as leaders for organized group study, and help students develop pro-active learning skills. Supplemental Instruction works. Nationally, SI participants earn course grades between one-half and one full letter grade higher than the average course grade of students not participating. SI is offered for many Texas A&M University core curriculum courses. Sessions are open to all students in the course section; participation is free and voluntary. If you are interested in this program, contact Student Learning Center at 979.845.2724 (http://slc.tamu.edu/).

**STUDENT COUNSELING SERVICE**

The Texas A&M University Student Counseling Center, located in Cain Hall (979.845.4427), is dedicated to improving skills in academic, career planning, and personal areas. The mission of the Learning Skills Center is to provide students with an opportunity to develop knowledge, skills, and attitudes which will enhance their study and test-taking ability, while decreasing anxieties related to academic performance. Services include academic counseling, conferences with student volunteers, faculty grade distribution lists, weekly academic workshops, academic support groups, and self-help study guides.

The Student Counseling Center also provides confidential personal counseling. Counseling provides an opportunity to talk about yourself, your feelings, your values, the way you relate to other people, or any other topic that concerns you. There is no charge for these services.

Academic or personal counseling appointments are available from 8 a.m. to noon and from 1 p.m. to 5 p.m. weekdays. If you find yourself in a crisis/emergency situation, you are encouraged to immediately go to Cain Hall, 8-5 weekdays. After hours, students may call the Helpline at 845-2700, or go to the nearest hospital emergency room (http://scs.tamu.edu).

**Graduation**

In order to graduate with a degree from Texas A&M University, the following requirements for graduation must be met (http://graduation.tamu.edu)

- Completion of all course work on the degree plan.
- A minimum overall GPR of 2.0.
- A minimum GPR of 2.0 in course work within your major field.
- A minimum of 36 semester hours of 300 and/or 400 level course work must be successfully completed in residence at Texas A&M University to obtain a baccalaureate degree. A minimum of 12 of these 36 semester hours must be in Horticulture.
- Graduation application and diploma fee during the semester in which graduation is to occur.
- Other requirements as outlined in the catalog year of the degree plan.

**APPLICATION**

The application deadline for graduation occurs shortly after the semester begins. The procedure includes the following:
Apply for graduation using Howdy → My Record tab → Degree Evaluation section → Apply for Graduation OR go to http://graduation.tamu.edu/applica.html. Follow the deadlines posted on http://graduation.tamu.edu.

If you have not had the diploma fee included with your tuition fees, it will be assessed at the time you apply online. All questions should be directed to the Registrar's Office (979.845.1089) at the General Services Building.

**GRADUATION WITH HONORS**

In order to graduate with honors, a student must have completed at least 60 credit hours at Texas A&M University, and have at least a 3.50 GPA. The following categories are recognized:

- Summa cum Laude (GPR of 3.90 - 4.00)
- Magna cum Laude (GPR of 3.70 - 3.89)
- Cum Laude (GPR of 3.50 - 3.69)

**COMMENCEMENT CEREMONY**

The graduation ceremony is held at Reed Arena. For fall/spring semester graduates, there are 3 - 4 separate exercises; the College of Agriculture and Life Sciences only participates in one of them. The commencement ceremony in which COALS students will participate is announced around mid-semester.

**SENIOR EXIT INTERVIEWS**

Senior exit interviews are conducted by the Head of the Department of Horticultural Sciences. The student will receive an e-mail from the Advising Office telling them when and where to sign up for these interviews. The interviews are usually held during the last few weeks of the semester. These interviews are very important to our Department. We solicit and respect your opinions and concerns about the teaching program, and encourage you to take advantage of this opportunity.

**DEPARTMENTAL BREAKFAST/LUNCHEON**

The Department of Horticultural Sciences holds a breakfast, luncheon, or reception for its graduates, their relatives, and the faculty in conjunction with the commencement exercises. This event gives the faculty an opportunity to meet the students’ families and gives the families an opportunity to learn a little about the department. All graduates are encouraged to attend even if their families are unable to attend.

**SENIOR RING**

Senior Rings may be ordered at the Former Student's Association Building. Students in good academic standing with a GPR of 2.0 or above, 90 earned undergraduate cumulative hours, 45 earned undergraduate resident, and no blocks are eligible to order a ring. Visit http://www.aggienetwork.com/ring/qualifications.aspx for more details on the qualifications and requirements. Applications for rings are taken at the end of the semester when 90 hours have been completed and verified by the Registrar’s office. Rings are usually available 3 months after they are ordered and paid for (http://www.aggienetwork.com/ring).
### SCHEDULE OF REQUIRED COURSE OFFERINGS IN HORTICULTURE

A tentative listing of required courses and the semester offered are listed below.

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</tr>
<tr>
<td>HORT 454</td>
<td>XX XX</td>
<td>XX XX</td>
<td>XX XX</td>
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<tr>
<td>HORT 481</td>
<td>XX XX</td>
<td>XX XX</td>
<td>XX XX</td>
</tr>
<tr>
<td>SCSC 301</td>
<td>XX XX XX XX XX XX XX XX XX</td>
<td>XX XX</td>
<td></td>
</tr>
<tr>
<td>CHEM 222</td>
<td>XX XX XX XX XX XX XX XX XX</td>
<td>XX XX</td>
<td></td>
</tr>
<tr>
<td>ENTO 201</td>
<td>XX XX XX XX XX XX XX XX XX</td>
<td>XX XX</td>
<td></td>
</tr>
<tr>
<td>GENE 310</td>
<td>XX XX XX XX XX XX XX XX XX</td>
<td>XX XX</td>
<td></td>
</tr>
<tr>
<td>PLPA 301/303</td>
<td>XX XX</td>
<td>XX XX</td>
<td>XX XX</td>
</tr>
<tr>
<td>MEPS 313</td>
<td>XX XX</td>
<td>XX XX</td>
<td>XX XX</td>
</tr>
</tbody>
</table>
Texas A&M University - Department of Horticultural Sciences

EMPHASIS AREA FORM

In order to plan your course of study, it is important to select one of the EMPHASIS AREAS from either the B.S. or B.A. degrees early in your educational career. Please select one EMPHASIS AREA before completing 45 hours of coursework from the following list:

Check the appropriate box:

☐ B.A. Urban Horticulture
☐ B.A. Floral Design

Check with the Department offering the minor for availability and necessary paperwork.

--Business Administration minor is the exception. You declare this minor in HFSB 204 with your major academic advisor.

☐ B.S. Nursery/Floral Crop Production and Management
☐ B.S. Science and Biotechnology
☐ B.S. Fruit and Vegetable Production and Management
☐ B.S. Landscape Management

Name     UIN#   E-mail Address
________________________________    _______________________
________________________________    _______________________

Signature       Date

Texas A&M University - Department of Horticultural Sciences
Appeal Form for “Study Emphasis Electives” not included on the approved elective lists

Student name _______________________________ UIN# ____________________________

NEO Email_________________________________________ Date ____________________________

Check the appropriate box:

Catalog 128☐ 129☐ 130☐ 131☐ 132☐ 133☐ 134☐ 135☐ Other ☐

Degree BS Horticulture ☐ BS Floriculture ☐

Emphasis Area Fruit/Vegetable Prod. & Mgmt. ☐ Landscape Management ☐

                       Nursery/Floral Crops Prod. & Mgmt. ☐ Science & Biotechnology ☐

BA Horticulture ☐

Emphasis Area Floral Design/Event Planning ☐

Urban Horticulture ☐

Course Number and complete name: ____________________________________________

Semester/Year course taken ____________________________________________

Name of institution where course was taken ________________________________________

Please state the reason that the course you took relates to your emphasis area and should be considered as a “Study Emphasis Elective” (you may include additional information such as syllabi, exams, course description, etc.)

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

Appeals are due on October 15th or February 15th. Students will be notified by their NEO email no later than November 1st or March 1st, respectively. Once the appeal is granted, the elective course will be applied as a “Study Emphasis Elective” on the student’s degree plan.

Approved ☐   Denied ☐   Date ______ email student ☐   ☐ Degree plan ☐

Comments on back
## HORT 485 - Special Problems Agreement

**Texas A&M University**  
**Department of Horticultural Sciences**  
**HORT 485 - Special Problems Agreement**  
(Must be completed before registration)

<table>
<thead>
<tr>
<th>Student Name ___________________________</th>
<th>ID # ___________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major ___________________ Classification ______</td>
<td>GPA ___________________________</td>
</tr>
<tr>
<td>(Must be Jr. or Sr. class)</td>
<td>(Must be 2.0 or &gt;)</td>
</tr>
<tr>
<td>Campus Address ___________________________</td>
<td>Local telephone ___________________</td>
</tr>
<tr>
<td>E-mail Address ___________________________</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HORT 485 Semester _______</th>
<th>HORT 485 Faculty Member ___________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 485 Credit (1-4 cr. hr.) _______</td>
<td>(1 credit assigned for each 3 hrs. of work expected per week during the fall/spring semester. Summer semester requires more weekly hours due to the condensed timeframe. A total of 6 cr. hrs. may be applied to HORT degree with approval)</td>
</tr>
</tbody>
</table>

Prerequisites or previous HORT experience

Proposed HORT 485 project (Attach any additional information)

Final Product:  
- Report ______  
- Presentation ______  
- Other ______  

The final product must be submitted to the faculty member and to Dr. Dan Lineberger, Head for Horticultural Sciences at least one week prior to the last day of the semester before a grade will be assigned. The approved paperwork should be submitted to the advising office in HFSB 204.

Anticipated completion date: ________________________________

Approval:

Student's Signature ___________________________

HORT 485 Instructor's Signature ___________________________  
Dr. Dan Lineberger, Head for Horticultural Sciences
Texas A&M University  
Department of Horticultural Sciences  
HORT 291/491 – Research  
(Must be completed before registration)

<table>
<thead>
<tr>
<th>Student Name______________________________</th>
<th>ID #________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major__________________  Classification______  GPA________________________</td>
<td></td>
</tr>
<tr>
<td>(Must be Jr. or Sr. class)  (Must be 2.0 or &gt;)</td>
<td></td>
</tr>
<tr>
<td>Campus Address_____________________________</td>
<td>Local telephone_______________</td>
</tr>
<tr>
<td>E-mail Address_____________________________</td>
<td></td>
</tr>
</tbody>
</table>

| HORT 291/491 Semester_____________ | HORT 291/491 Faculty Member_____________________
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 291/491 Credit (1-3 cr. hr.)_______</td>
<td>(1 credit assigned for each 3 hrs. of work expected per week during the fall/spring semester. Summer semester requires more weekly hours due to the condensed timeframe. A total of 6 cr. hrs. may be applied to HORT degree with approval)</td>
</tr>
</tbody>
</table>

Prerequisites or previous HORT experience___________________________________________
______________________________________________________________________________
______________________________________________________________________________

Proposed HORT 491 project (Attach any additional information)__________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Final Product:  Report______  Presentation ______  Other_______________________

The final product must be submitted to the faculty member and to Dr. Dan Lineberger, Head for Horticultural Sciences at least one week prior to the last day of the semester before a grade will be assigned. The approved paperwork should be submitted to the advising office in HFSB 204.
Anticipated completion date:  ________________________________

Approval:

Student's Signature  
Student must register for HORT 491 one year prior to expected graduation

HORT291/491Instructor's Signature  Dr. Dan Lineberger, Head for Horticultural Sciences
## Appendix 3.1 - Texas A&M University - 18 Characteristics of Texas Public Doctoral Programs

Programs included only if in existence 3 or more years. Program is defined at the 8-digit CIP code level.

<table>
<thead>
<tr>
<th>Department</th>
<th>Horticultural Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctoral Degree Program</td>
<td>Horticulture</td>
</tr>
</tbody>
</table>

1. **Number of Degrees Per Year**

<table>
<thead>
<tr>
<th></th>
<th>2009-2010</th>
<th>2010-2011</th>
<th>2011-2012</th>
<th>3 Year Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average, 2009-2012</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Three-year average of the number of degrees awarded per academic year</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>2.3</td>
</tr>
</tbody>
</table>

2. **Graduation Rates**

- **Starting Cohorts: 2000-2002**
  - % Graduating within 10 Years: 92.31%
  - Years with Cohort greater than 0: 2000, 2001, 2002

3. **Average Time to Degree**

- **Students Starting 2000-2002**
  - Average Years to Degree: 4.54

4. **Employment Profile**

   **In field within one year of graduation. For each of the three most recent years, the number and percent of graduates by year employed, those still seeking employment, and unknown**

<table>
<thead>
<tr>
<th></th>
<th>Employed</th>
<th></th>
<th>Still Seeking Employment</th>
<th></th>
<th>Unknown</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>2009-2010</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2010-2011</td>
<td>3</td>
<td>66.7</td>
<td>1</td>
<td>33.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2011-2012</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

5. **Admissions Criteria**

   **Description of admission factors**

   - GPR>3.00, competitive GRE in verbal and quantitative, acceptable TOEFL for non-English language international students, strong letters of recommendation, and well developed statement of purpose.

6. **Percentage Full-time Students**

   - **Fall 2010**: 73.3%
   - **Fall 2011**: 90.0%
   - **Fall 2012**: 85.0%

7. **Average Institutional Financial Support Provided**

   - $19,903.47

8. **Percentage Full-Time Students with Institutional Financial Support**

   - 83.30%

9. **Number of Core Faculty**

   - 27

10. **Student-Core Faculty Ratio**

    - .7
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Core Faculty Publications</td>
<td>5.85</td>
</tr>
<tr>
<td>12</td>
<td>Core Faculty External Grants</td>
<td>16.33</td>
</tr>
<tr>
<td>12</td>
<td>Average of the Number of Core Faculty receiving external funds</td>
<td>16.33</td>
</tr>
<tr>
<td>12</td>
<td>Average External Funds per Faculty</td>
<td>$164,555.05</td>
</tr>
<tr>
<td>12</td>
<td>Total External Funds</td>
<td>$2,689,311.00</td>
</tr>
<tr>
<td>13</td>
<td>Faculty Teaching Load</td>
<td>5.4</td>
</tr>
<tr>
<td>14</td>
<td>Faculty Diversity</td>
<td>Male</td>
</tr>
<tr>
<td>14</td>
<td>White</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>Black</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Hispanic</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>Other</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>Student Diversity</td>
<td>Fall 2012</td>
</tr>
<tr>
<td>15</td>
<td>White</td>
<td>2</td>
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<tr>
<td>15</td>
<td>Black</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Hispanic</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>Date of Last External Review</td>
<td>May, 2005</td>
</tr>
<tr>
<td>17</td>
<td>External Program Accreditation</td>
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<tr>
<td>18</td>
<td>Student Publications and/or Presentations</td>
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</tr>
</tbody>
</table>
Appendix 3.2 – Horticulture Graduate Policy Manual

GRADUATE POLICY MANUAL
DEPARTMENT OF HORTICULTURAL SCIENCES
TEXAS A&M UNIVERSITY
(Revised November 2012)

PURPOSE
The purpose of the Department of Horticultural Sciences Graduate Policy Manual is to summarize those policies that frequently are encountered or misunderstood by graduate students in the Department. In addition, specific policies established by the College of Agriculture and Life Sciences (COALS) and the Department of Horticultural Sciences are presented. These policies appear in the text in italics. The Policy Manual is a supplement to the Graduate Catalog and does not replace it.

GRADUATE CATALOG
The official policies of Texas A&M University are published annually in the Graduate Catalog and updated on the Office of Graduate Studies website (http://ogs.tamu.edu). It is the responsibility of each graduate student to study and abide by the policies set forth in the most recently published Graduate Catalog and on the Office of Graduate Studies Website.

The Department cannot stress enough that it is the graduate student's responsibility and duty to become intimately familiar with all policies that affect their graduate program and to correctly follow all policies in a timely manner.

OFFICE OF GRADUATE STUDIES
The Office of Graduate Studies (OGS) is the University office responsible for administering the graduate programs of Texas A&M University. OGS is located on main campus in the Jack K. Williams Administration Building (Room 302). All petitions, requests and proposals are turned in to OGS for final approval. Technical questions that cannot be answered at the Department level should be addressed to OGS. The Office of Graduate Studies publishes a Graduate Student Calendar every semester which gives the precise dates for all deadlines, and it should be consulted regularly. The calendar can be obtained from OGS in the Administration Building or the OGS website. The OGS also produces a Graduate Handbook that contains much helpful information which is available on their website (http://ogs.tamu.edu).

The OGS has much of the information relative to graduate programs on their website. The OGS website can be accessed at http://ogs.tamu.edu. All university level forms relative to your graduate program must be obtained from the OGS website. All Department level forms can be obtained from HFSB 204 or the Department’s Home Page – http://hortsciences.tamu.edu.

DEPARTMENT’S HOME PAGE
The Department of Horticultural Sciences’ website http://hortsciences.tamu.edu. contains a wealth of information about the Department, including the Graduate Policy Manual, biographical sketches of all graduate faculty members in the Department, and links to other useful information, such as the OGS website. Aggie-Horticulture.tamu.edu is also a good source to keep up with the activities of the Department.

REGISTRATION PROCEDURE
To maximize efficient use of funds and facilities, graduate students should move toward fulfillment of their degree requirements as rapidly as possible. Students should work with their Graduate Advisor and Advisory Committee to establish the courses to be taken to satisfy their degree requirements (see section on Degree Program). The registration procedure is as follows:

1. Select the courses in consultation with your Graduate Advisor and Advisory Committee.
2. You may register on-line during your designated registration period at http://howdy.tamu.edu and accessing “my record”. It is advisable to pre-register. There are monetary penalties for late registration (http://finance.tamu.edu/sbs).

MINIMUM REGISTRATION AND CONTINUOUS REGISTRATION
The Graduate Catalog and OGS website contain the latest official information on this topic. Policies specific to Horticulture graduate students or frequently asked questions are as follows:

Minimum and Maximum Registration
Table 1 lists the minimum and maximum registration requirements for graduate students. It is basically a tabular interpretation of the guidelines specified in the Graduate Catalog as modified by policies set forth by the Department, COALS, and OGS. In the event of a conflict in requirements, the default is always to those requirements of the University and College over those of the Department.

Departmental Policy on Minimum and Continuous Registration
All graduate students in the Department (regardless of major) must maintain a continuous enrollment of a minimum of 1 credit hour per semester (fall, spring and summer) from the semester of first enrollment until the semester of graduation. The student can request a waiver based on full-time employment by Texas A&M University System (TAMUS), medical reasons, leaves of absence, etc. If a waiver is granted, the student cannot be on-campus or at a Texas A&M AgriLife Research Center or other TAMU System facility actively completing requirements for their degree, except for a waiver granted to full-time TAMUS employees. The Minimum Registration Waiver form (see Form 1) can be obtained from the Department (HFSB 204). This continuous registration requirement is in addition to the University requirement for continuous registration for students that have completed all course requirements (other than 684, 691 and 693) on their Degree Plan. A waiver from the University requirement can only be obtained by filing a Leave of Absence petition with the Office of Graduate Studies (OGS). Any student in violation of the continuous registration requirement will have their registration blocked. The block can be removed only after the student consults with the Associate Head for Graduate Programs, who will consult with the Chair of the Advisory Committee before removing the block. A letter of reinstatement must be sent from the Associate Head for Graduate Programs to the Director of OGS for students blocked by OGS. If a student is allowed to register after missing continuous registration for 1 or more semesters, then they must register for 1 credit hour for each semester in violation plus the current semester.

Waiver of Minimum Registration
If you feel your situation justifies registration below that stated in Table 1, fill out a Minimum Registration Form (Form 1) and turn it in to the Associate Head for Graduate Programs (HFSB 204) for approval before the first day of classes for that semester. Waivers cannot be granted for students on assistantships.

Time Limit on Course Work
Masters degree candidates must complete their course work within seven years of the first semester registration, and Ph.D. degree candidates must complete their course work within ten years. Course work taken before these periods of time cannot be used towards the degree.

100 Hour Cap Rule
Ph.D. students exceeding seven years will be penalized on hours enrolled above 100 hours in following semesters. Tuition equivalent to that of out-of-state tuition will be charged on the excess hours. This is a TAMU policy which cannot be waived by the Department.

MINIMUM COURSE PREREQUISITES
Suggested Course Prerequisites
Suggested course prerequisites vary among the M.Ag., M.S. or Ph.D. degrees depending upon the desired internship experience, research project desired, which subdiscipline within the field is chosen, and the post-graduation goals of the prospective student. Most prerequisites for programs within the Department are accomplished by a B.S. in Horticulture, Agronomy, Biology or related sciences. Some remedial course work may be required for applicants with Bachelors degrees from widely divergent fields of academia.

Departmental Policy on Course Prerequisites
All graduate students in the Department of Horticultural Sciences must have taken or will take 6 credit hours of 200, 300, 400 or 600 level HORT courses prior to admission. In the event that the student is deficient in HORT, the 6 hours must be taken at TAMU as a prerequisite of their degree. The courses must be approved by the Chair of their Advisory Committee. Any 300, 400 or 600 level courses may be applied towards the student’s Degree Plan with the Chair and Committee’s approval. These 6 hours of HORT courses will be in addition to the 9 hour Master’s and 12 hour Doctoral requirement at the 600 level for all HORT graduate students. If the student is deficient in non-HORT supporting field courses (for example, chemistry, soils, plant physiology, etc.), the Chair will determine course prerequisites that need to be taken.

Graduate students in the Department of Horticultural Sciences majoring in molecular and environmental plant physiology (MEPS), genetics (GENE), food science and technology (FSTC), or plant breeding (PLBR) must meet the course prerequisite requirements set forth by the Interdisciplinary Faculty of that major.

Courses Specified by the Graduate Admissions Process
In addition to the above Departmental course prerequisites, the graduate admissions process may specify certain courses as a condition of acceptance into the Department’s graduate program. Individual Chair or Advisory Committees may also require certain courses to be taken as a prerequisite to a degree. These decisions are made based on the student’s background, degree pursued and/or type of research or internship to be undertaken, and are made on a case by case basis.

DEGREE PLAN AND GRADUATE ADVISORY COMMITTEE

Degree Plan
The Degree Plan establishes all course work required for the graduate degree and also establishes the Graduate Advisor and Advisory Committee.

The Degree Plan will list the courses that a student must complete for their degree. In addition, prerequisite courses that the committee feels are necessary to fill-in gaps in the student's previous training or education may be listed. See Degree Plan Deadlines for pertinent deadlines.

The degree plan is submitted on-line. Please see the OGS website (http://ogs.tamu.edu) under current student tab for specific instructions.

Departmental Policy on Minimum Course Requirements
All graduate students in the Department must:

1) regardless of major, take or have taken one graduate level statistics course per degree (i.e. one for the Masters and another for the Ph.D.; if none were taken for the Masters, then two are required for the Ph.D.). This may be satisfied by a graduate level statistics course or a graduate level experimental design/data analysis course in a subject matter department;

2) regardless of major, take one 681 seminar course per degree (i.e. one for Masters and another for Ph.D.). The seminar may be in Horticulture (i.e. HORT 681) or in the student’s major (i.e. MEPS 681, GENE 681 or FSTC 681). If a student transfers from another major and has already taken a 681 equivalent in that major, then the 681 requirement will be waived for that degree. It is also expected that all Horticulture graduate students attend the biweekly seminar series organized by the Department of Horticultural Sciences throughout their studies in the Department. This series is designed to expose students and faculty to the wide diversity of activity in horticulture.

3) All Master of Agriculture or Master of Science students must take nine hours and Ph.D. students must take twelve hours of graduate level instructional HORT courses (excluding HORT 684, 685, 690, 691 or 693) in addition to the HORT 681 seminar requirement. Ph.D. students who have taken nine hours during their M.S. program in the Department can use these nine hours as part of the 12 hour requirement for their degree (effective August 2011).

4) All other curricular matters are at the discretion of the student and his/her Graduate Advisor and Advisory Committee, assuming the requirements of the Department and Graduate Catalog are met.
Schedule of Horticulture Graduate Course Offerings
Table 3 lists all graduate courses offered in the Department and the tentative semesters in which they are projected to be offered. This table is intended for planning purposes, but due to a variety of reasons impacting faculty schedules and Departmental resources is subject to change without notice.

Use of Transfer Courses
Consult the latest edition of the Graduate Catalog for the section on Limitation on the Use of Transfer, Extension and Certain Other Courses. These guidelines located under the degree type section (M.Ag., M.S., Ph.D) must be followed in preparing a Degree Plan.

Degree Plan Deadlines
Degree Plans must be completed and filed with OGS: 1) during the 2nd regular semester and prior to registration (or preregistration) for a third term for Master candidates and during the 4th regular semester and prior to registration (or preregistration) for the fifth term for Doctoral candidates and 2) no later than 90 days prior to the date of the final oral examination or thesis defense for Masters candidates or preliminary exam for Doctoral candidates. The student will be blocked from registering by OGS if the degree plan has not been filed by the specified semester.

Graduate Advisor or Chair of the Graduate Advisory Committee
The graduate advisor serves as the Chair of the Graduate Advisory Committee. The student may request a particular faculty member to serve as their graduate advisor. If the student does not have enough knowledge to make this decision, then a graduate advisor is assigned to the student prior to admission to the program. The graduate advisor should be selected based on the interest and goals of the student, workload and interest of the faculty, funding availability, and availability of facilities and equipment. Students seeking to apply for a M.Ag., M.S., or Ph.D degree in Horticulture should have identified a member of the graduate faculty to serve as their advisor as students applying for Horticulture degree programs are not admitted unless a faculty member indicates agreement to serve as their advisor.

The graduate advisor plays the primary role in the development of a graduate student's program. The graduate advisor assists the student in preparation of a Degree Plan.

The student should work closely with the graduate advisor to determine that the graduate program is meeting the student's goals, and to seek advice from the advisor on problems that may develop during the course of graduate study.

Members of the Graduate Advisory Committee
In addition to the graduate advisor, who functions as the Chair, Master candidates must select two faculty members to serve on their Advisory Committee, and Doctoral candidates must select three faculty members to serve on their Advisory Committee. At least one of the committee members must be from outside the student’s Department or major.

Any member of the Graduate Faculty can serve as a committee member. Graduate Faculty in the Department of Horticultural Sciences include those faculty who hold Assistant Professor, Associate Professor, or Professor rank or a Distinguished Lecturer designation and have been approved at the Department, COALS, and University levels for inclusion as Graduate Faculty. A list of all Graduate Faculty in the Department appears in Table 2. A Biographical Sketch of all Graduate Faculty and Adjunct Graduate Faculty in the Department is available on the Department’s website, http://hortsciences.tamu.edu. The Graduate Catalog contains a list of all members of the Graduate Faculty in the University. The Advisory Committee may include Texas A&M University faculty or staff that are non-members of the Graduate Faculty (such as post-doctoral Research Associates, Research Scientists, Lecturers, Research Assistant Professors, Research Associate Professors, or Research Professors), or even qualified individuals from outside the University, with special permission from the Director of OGS. Non-members of the graduate faculty must be in addition to the normal contingent of graduate faculty members on the committee.

Preliminary Graduate Advisory Committee Meeting
The student should schedule an advisory committee meeting prior to the second semester's registration. The purpose of this meeting is to determine a student's level of competence, and to guide the student in developing a plan of
study which meets his or her career goals. The meeting is informal and consists of an interchange between the student and the committee members. The student, with the help of the graduate advisor, should prepare a preliminary Degree Plan and a preliminary research/internship plan for discussion at the meeting. The meeting will end with suggestions for the student on preparing the Degree Plan and the internship/thesis/dissertation proposal. The committee may suggest an additional meeting at a later date to finalize the program of study and proposal as needed.

**THESIS/DISSERTATION PROPOSAL**

An M.S. candidate must develop a thesis proposal, and a Ph.D. candidate must develop a dissertation proposal. The proposal describes the area of research, lists the objectives of the research, and presents the methodology and approach that will be used. A cover page for the proposal (Form 3) and the guidelines for preparing the proposal can be obtained from the OGS website. If the research involves human or animal subjects, an approved form from the Institutional Review Board for Human Subjects or The University Laboratory Animal Care Committee for animal use must accompany the proposal. All M.S. students in the Department of Horticultural Sciences must file a thesis proposal with the OGS prior to registration (or preregistration) for a third regular term. All Ph.D. students in the Department of Horticultural Sciences must file a dissertation proposal with the OGS prior to registration (or preregistration) for a regular fifth term. If the thesis or dissertation proposal is not filed by this time, students will be blocked from registration by the Department.

**PRELIMINARY EXAMINATION**

A preliminary examination is required for all Ph.D. students; waivers are not permitted. Refer to the latest issue of the Graduate Catalog and OGS website for details. All Ph.D. students are eligible, beginning the semester after successful completion of the preliminary examination, for a $50 per month increase if they have successfully completed their preliminary examination and are employed on an assistantship. This increase will be provided from the same source of funds used to fund their assistantship during a given semester. It is the student’s responsibility to notify payroll in the Horticultural Sciences Departmental office of the new status.

**M.S. THESIS AND PH.D. DISSERTATION**

In the Department of Horticultural Sciences, an M.S. degree requires a thesis and a Ph.D. degree requires a dissertation. Research problems should be carefully selected by the student, their Graduate Advisor, and Advisory Committee to investigate areas of mutual interest with significant research potential.


Master of Agriculture students within the Department are required to provide a CD containing one electronic copy of the professional paper in Adobe Acrobat (pdf) format and an original paper copy of the signed signature page in paper copy format to the Associate Head for Graduate Programs by the last Friday of regularly scheduled classes during the semester in which the student intends to graduate. If these are not provided, a block will be placed on graduation. Copies of the thesis and dissertation for M.S. and Ph.D. students, respectively, are maintained by the Texas A&M University library and clearance from the thesis office by their published deadlines is required prior to graduation.

**EXIT SEMINAR**

An exit seminar summarizes the major findings, experiences and accomplishments of a Master of Agriculture internship, Master of Science thesis or Doctor of Philosophy dissertation. The exit seminar is presented at the end of a graduate student’s graduate program. See OGS Calendar for deadlines.

**Departmental Policy on Exit Seminar**

All graduate students in the Department, regardless of major, must present a final exit seminar (not for course credit) on the final results of their internship and professional paper for M.Ag. students, or their thesis or dissertation research for M.S. and Ph.D. students. These seminars must be announced by the graduate student between 1 to 2 weeks in advance of the seminar by placing fliers in mailboxes and posting on bulletin boards on all floors of the HFSB and sending a copy of the announcement to the Department’s Associate Head for Graduate Programs or their designated representative for electronic distribution. The exit seminar must have open attendance. The scheduled time for the exit seminar is determined by the student and graduate advisor, and is often
MINIMUM GRADE POINT RATIO (GPR)
Graduate students must maintain a minimum cumulative grade point ratio (GPR) of 3.000 on both the courses on the Degree Plan and on all graded graduate (600) and advanced undergraduate (300, 400) courses eligible to be applied toward a graduate degree. The cumulative GPR is calculated from all graded (excludes S/U) courses taken at Texas A&M University that are eligible to be used on the Degree Plan (i.e. all 300, 400 and 600 level courses). The University policy and method of calculation of the GPR is described in detail in Graduate Catalog.

Departmental Policy on Minimum GPR
If a graduate student’s GPR falls below a cumulative 3.000, then the following Departmental policy details the procedures that are followed.

All graduate students must maintain a cumulative grade point ratio (GPR) of 3.000 or greater. Any student whose cumulative GPR falls below a 3.000 will be allowed the next semester in which they are enrolled to raise their cumulative GPR to or above a 3.000. For students on an assistantship or fellowship, funding for that semester will be allowed only if justified to the satisfaction of the Associate Head for Graduate Programs, Department Head, Executive Associate Dean of COALS, and Director of OGS. A letter of justification for continued funding is forwarded from the Chair of the Advisory Committee, through the Associate Head for Graduate Programs, and to the Department Head. The Department will then make a recommendation to the Executive Associate Dean of COALS and Director of OGS for a final decision.

If the student’s cumulative GPR is not raised to 3.000 or above after the next semester of enrollment, or if the student’s cumulative GPR falls below 3.000 in any subsequent semester (i.e. if a student ever has two semesters with a cumulative GPR below a 3.000, whether the semesters are consecutive or not), the Chair and Advisory Committee will be asked to recommend if the student should be allowed to continue their graduate program. A written recommendation as to the future of the student’s graduate program will be sent from the Chair, through the Associate Head for Graduate Programs, and to the Department Head. If the student is allowed to continue, all graduate assistantship and fellowship funding will be terminated immediately, unless extraordinary justification is presented. The Department will then make a recommendation to the Executive Associate Dean of COALS and Director of OGS for a final decision.

If, after the second violation, the student’s cumulative GPR is not raised to 3.000 or above after the next semester of enrollment, or if the student’s cumulative GPR falls below 3.000 in any subsequent semester (i.e. if a student ever has three semesters with a cumulative GPR below a 3.000, whether the semesters are consecutive or not), the graduate student will be terminated from the graduate program immediately, unless extraordinary justification is provided by the Chair, through the Associate Head for Graduate Programs, and to the Department Head. The Department will then make a recommendation to the Executive Associate Dean of COALS and Director of OGS for a final decision.

ELEMENTS OF A MASTER OF AGRICULTURE PROGRAM
Internship
All M.Ag. students must devote a minimum of three consecutive months full-time, or its equivalent, to an internship experience. The internship is selected in cooperation with their Graduate Advisor and Advisory Committee and approved by the Associate Head for Graduate Programs. In the interest of broadening a student’s experiences, advisory committees are discouraged from approving internships at the student’s family business or at a firm at which the student is currently or formerly employed. Along this same reasoning, advisory committees are discouraged from approving internships that allow students to remain on campus.

Professional Paper
The professional paper is based on the internship experience and has three main parts: preliminary pages, the text, and, supplementary pages.
1. Preliminary Pages (in the following order)
   a. Title page
   b. Approval page (Form 2 in Appendix)
   c. Abstract (the first numbered page, iii)
   d. Dedication page (optional)
   e. Acknowledgment (optional)
   f. Table of Contents
   g. List of Tables (if more than one table is used)
   h. List of Figures (if more than one figure is used)

2. Text (normally requires the following)
   a. Introduction (problem studied at internship site)
   b. Review of Literature
   c. Objectives (for the problem-solving experience)
   d. Results
   e. Conclusions and/or Recommendations
   f. Additional Internship Experiences

3. Supplementary Pages (in the following order)
   a. Bibliography, references or literature cited
   b. Appendices (if needed)
   c. Vita

APPROVAL AND FILING OF PROFESSIONAL PAPER

a) During their final semester, Master of Agriculture students are required to enroll, in addition to any other course requirements, in one hour of HORT 693 under the direction of the Associate Head for Graduate Programs.

b) The Head will only sign the signature page after the paper has been cleared by the Associate Head for Graduate Programs. The Head may designate the Associate Head for Graduate Programs as an alternate signatory.

c) One CD containing one electronic copy of the professional paper in Adobe Acrobat (pdf) format and an original signed paper copy of the signature page for the professional paper will be provided to the Associate Head for Graduate Programs by the last Friday of regularly scheduled classes during the semester in which the student intends to graduate. If these are not provided, a block will be placed on graduation.

ASSISTANTSHIPS AND FELLOWSHIPS

Types of Assistantships and Fellowships
The following graduate assistantships are available: Graduate Assistant Research (GAR), Graduate Assistant Teaching (GAT), Graduate Assistant Non-Teaching (GANT), Graduate Assistant Extension (GAE) and Graduate Fellowship (GF). Assistantships and fellowships are awarded by the Department, College, University, endowments or sponsoring agencies. Assistantships require a work commitment, such as teaching undergraduate laboratory sections or working in a research laboratory. Fellowships do not require a work commitment and are more comparable to a scholarship.

Competitively Awarded
All graduate assistantships and fellowships are awarded on a competitive basis. Those awarded for a given semester will be for the specified academic semester only. Those awarded for multiple semesters or for the duration of the student's graduate program (subject to Departmental guidelines) are contingent on continued satisfactory performance as a graduate assistant as well as their overall graduate performance and availability of funds.

Graduate Application Deadlines
Two soft deadlines for evaluation of graduate program applications occur each year; September 15 each fall and January 15 each spring. Applications received by that date will be given full consideration by the Department’s graduate application evaluation committee (GAEC) for open assistantships.

i.) The GAEC will consist of all full and associate members of the graduate faculty in the Department of Horticultural Sciences.
ii.) Assignment of teaching assistantships will be based on the strength of the qualifications of the student and their suitability to teach the courses associated with the available slot. Although students will be assigned to assist with a given course or courses, the need to change course assignments to accommodate budget changes, undergraduate curriculum changes and other considerations may exist. Students assigned to a given course will be independent of whether or not their advisor instructs the course(s). There will be an attempt to minimize shifts in teaching assignments, in order not to over burden students with preparation of new lesson/lab plans nor faculty with retraining student teaching assistants each semester.

iii.) Recruitment of the highest quality students for graduate research and quality instruction in the classroom/laboratory will be the first priority. This is combined with a fair and equitable rotation of assistantships to various programs in the department including due consideration of faculty participation in undergraduate and graduate classroom instruction, student organization advising, and departmental service.

Individual faculty seeking to recruit individual students for grant-funded assistantships may request evaluation of students’ applications outside of the general departmental application deadlines. Evaluation of the applications for these students will follow our previous model of an ad hoc evaluation committee of six faculty members from related fields to those areas of interest indicated by the student in their statement of purpose. These committee members will be appointed by the Associate Head for Graduate Programs at the request of the faculty member(s) interested in recruiting the students.

**Minimum GPR and GRE**
The Department requires all students on assistantships and fellowships to have a minimum entrance GPR of 3.000 and to maintain a minimum graduate GPR of 3.000 throughout their program. Successful applicants to the M. Ag. or M.S. programs typically have an undergraduate GPR of 3.00 or better, GRE scores of approximately 500 in verbal and 500 in quantitative or greater, strong letters of support for admission to the graduate program from faculty mentors, a well written letter of application, and in the case of international students strongly demonstrated competency in English via TOEFL scores or other testing instruments. Applicants for the Ph.D. program whom have successfully completed a prior M.S. degree usually have similar or greater qualifications than those outlined for admission to the Masters programs. Applicants for a Ph.D. program directly from an undergraduate program without a prior M.S. degree are typically successful in being admitted only if able to demonstrate abilities beyond those usually demonstrated by applicants to the Masters programs. Examples might include a combination of more highly competitive GPR or GRE scores, very strong letters of reference, and especially evidence of prior research experience. Evidence of prior research experience might include authorship or co-authorship on peer reviewed research articles, experience in an undergraduate research program or course, or a letter from a faculty member detailing your direct involvement in research efforts in their laboratory. Students successfully admitted to the Ph.D. program with only a B.S. are strongly discouraged from transferring to a Masters program later in their term of study.

**Transfer from M.S. to Ph.D. programs**
Transfer from a M.S. program to a Ph.D. program of study is permitted with unanimous approval of their graduate program committee. A consenting committee member will likely need to be added to reach the required minimum number as outlined by OGS.

**Minimum Registration - Full-Time Status**
Graduate students on any level of assistantship or fellowship funding must register for full-time course load. For the fall and spring semesters, full-time status is 9 credit hours. Full-time status for summer semesters is 6 hours. Full-time registration cannot be waived for students on assistantships or fellowships. Full-time status may also be required for certain scholarships, insurance coverage, loan eligibility or international student status. These requirements should be investigated by the student when less than full-time enrollment is being considered.

**Time Limit on Assistantships**
As a general policy, appointment to a graduate assistantship or fellowship will not be granted to persons who go beyond 24 months of full-time graduate study or equivalent at the Master's level, and 36 months of full-time graduate study or equivalent at the Doctoral level. Extensions can be granted with approval of the Associate Head for Graduate Programs. Full-time graduate study is defined as 9 or more credit hours in a fall/spring semester and 6 or more credit hours during the summer. Each student's performance is reviewed each semester by their supervisor.
for that semester. Continuation as a graduate assistant will be contingent on a satisfactory evaluation. The length of Fellowships varies, and is specified when the Fellowship is awarded.

**Medical Benefits**
Graduate students on \( \frac{1}{2} \) time (20 hours/week) or greater assistantships receive medical benefits through the Graduate Student Insurance Plan after 90 days for new employees (students should consult the appropriate agency or university personnel office to obtain the latest rules relating to employment and benefits). The benefits can be extended to their spouse and dependents for an additional fee. Graduate students on fellowships do not receive medical benefits. Medical insurance policy information is available on the Office of Graduate Studies (ogs.tamu.edu) website.

**Outside employment**
According to the Payroll Office, if a graduate student is on a 20 hour per week or greater teaching or research assistantship they cannot be employed in any other capacity on-campus. The Payroll Office conducts computer checks of all students for additional employment on-campus on a semester basis, and actively enforces this policy. Off-campus employment is not restricted by the Department unless a conflict of interest is involved. Any potential conflicts of interest between on-campus and off-campus employment should be reported immediately to the Department Head and the appropriate financial disclosure forms must be filed.

**Training & Safety Documentation**
Each graduate student working in research or teaching laboratories is responsible to provide evidence of the introductory laboratory safety training course to the Main Administrative Offices of the TAMU Department of Horticultural Sciences prior to beginning employment with the Department. For those students working in greenhouses or nurseries, a Texas Department of Agriculture Pesticide Handler’s Card is required before beginning work in the greenhouse or nursery. Training for pesticide handler’s certification is offered in the Department on a regular basis and students should consult with the office staff to determine the next available training date. Graduate students are periodically required by TAMUS, COALS, the Department, or their graduate advisors to obtain additional safety and employment related training. Documentation of all such training should be provided to appropriate personnel in the Main Administrative Offices of the Department.

**TEACHING EXPERIENCE**
Wherein possible, all students should be encouraged to obtain a minimum of one semester's teaching experience as a teaching assistant in an undergraduate laboratory section during their tenure at Texas A&M University. All graduate students are eligible, beginning the semester after successful completion of the Center For Teaching Excellence Graduate Teaching Academy Fellow program (gta.tamu.edu), for a $25 per month increase if they have successfully completed the GAT Fellow program and are employed on an assistantship. This increase will be provided from the same source of funds used to fund their assistantship during a given semester. It is the student's responsibility to provide documentation to payroll in the Department of Horticultural Sciences of their new status.

**NONRESIDENT TUITION EXEMPTIONS**
The following conditions allow a non-resident of the State of Texas to obtain a non-resident tuition waiver as a result of House Bill (HB) 1147. Current information on this topic can be found in the appendix of the most current catalog in “Rules and Regulations for Determining Residence Status” which can be obtained through OGS.

**Competitive Scholarships**
A scholarship is one, which is designated as competitive by the institution, whose sum either singularly or in combination with other competitive scholarships totals the amount of $1000, that is publicized and open to all students including Texas residents; and which has been selected by the institution to be a basis for the waiver of nonresident tuition charges.

**Faculty and Dependents**
Teachers, professors, and research associates who are employed at least one-half time on a regular monthly basis by a Texas institution of higher education are entitled to register themselves, their spouse, and their children in a Texas institution of higher education by paying the tuition and fees required of Texas residents. This is subject to change by the Texas state legislature.
Assistantships and Fellowships
Teaching assistants, research assistants, and graduate assistants non-teaching who are employed at least one-half
time at a Texas institution of higher education and whose job duties are related to teaching or research in an
academic program associated with their field of study are entitled to register themselves, their spouse and their
children in the employing Texas institution of higher education by paying the tuition and fees required of Texas
residents subject to change by the state legislature.

Provisions for Improper Registration for Tuition Purposes
HB 1147 requires that if a student falsely registers as a resident student when he or she is actually a nonresident, the
student has 30 days from the date of notification by the University to pay the amount he or she should have paid as a
nonresident. If the individual fails to make a timely payment as required by law, the individual is not entitled to
receive a transcript or to receive credit for courses taken during the time the individual was falsely registered as a
resident student.

Nonresident Tuition Exemption Form
Blank forms can be obtained from HFSB 204 and must be completed each semester. The form is completed by the
student, signed by their employer, and then signed by the Associate Head for Graduate Programs or designated
Departmental representative (currently Ms. Jennifer Jakubik). If the student is employed by the Department of
Horticultural Sciences, the form is filed and processed in HFSB 202 before fees are to be paid. If a student is
employed by another department, the form should be filed with the Office of Graduate Studies. Student is required
to be registered <9 hrs before processing the form.

Establishing Texas Residency
The ideal solution is to be declared a Texas resident. This determination is made by the Registrar in the Office of
Admissions and Records. You should contact the Registrar directly if you have questions.

HOLIDAYS FOR GRADUATE STUDENTS ON ASSISTANTSHIPS
Graduate students on assistantships are considered part-time employees of TAMU, TAES or TCE. As such they are
entitled only to time off during official University holidays and do not accrue vacation time or sick leave. However,
students on GAR or GAT may make arrangements with their supervisor to take time off during non-University
holidays; but this must have their supervisor's approval and they must make up the work missed either before or
after the time gone.

PERSONAL COMPUTER USE IN GRADUATE STUDENT OFFICES
Graduate students may use their personal computers in their assigned offices and laboratories, but TAMU, Texas
A&M AgriLife Research, Texas A&M AgriLife Extension, and the Department assume no liability for theft or
damage to the computers. Only Department / University owned computers are eligible to be connected to the
Departmental computer network. This restriction is a result of potential liability, security, and labor issues related to
the connection of the personal computers to the Departmental network. Appeals for exceptions to this policy should
be made to the Associate Head for Graduate Programs. If an exception is granted, unrestricted access to the
computer will be granted to the Department’s System Analyst for purposes of maintaining security and risk
management of the Departmental network. Any computers connected to the network must be equipped with up-to-
date virus protection software and other software as dictated by TAMU System, University, College, and
Departmental policies. In addition, all users regardless of who owns the computer are subject to university
guidelines for computer usage (http://student-rules.tamu.edu/).

SIGNATURES
All petitions, degree plans, thesis/dissertation proposals, requests for final exams, change of major, drop/add forms,
late registration, minimum registration forms, etc. require Departmental approval. The current Department Head has
designated that all requests and forms be signed by the Associate Head for Graduate Programs. If the Associate
Head for Graduate Programs is not available, then the Head can sign in their place. The final copy of the
thesis/dissertation is signed by the Head, or at his designation the Associate Head for Graduate Programs.
Many items also require Dean’s approval. Dean’s signatures are obtained from the Dean’s Office.

BLOCKS
Blocks (such as registration blocks) placed on the student by the Department can only be removed by the Department Head or Associate Head Graduate Programs. Blocks placed by other units within TAMUS (Deans Office, OGS, Parking and Transit, Fiscal Office, etc.) can only be removed by that unit.

**ANNUAL GRADUATE STUDENT EVALUATION**
At the end of each academic year all graduate students affiliated to the Department of Horticultural Sciences are required to complete in cooperation with their advisor (co-advisors) the Annual Graduate Student Evaluation form. The latest version of this form is available on the graduate section of the TAMU Department of Horticultural Sciences website. The purpose of this evaluation is to determine a student’s progress toward fulfilling their degree requirements, enhancing goal setting for the coming year, documenting the student’s accomplishments, and encouraging timely feedback between the student and advisor on the student’s professional development and career goals.

**GRADUATE RECORDS CONFIDENTIALITY**
The Graduate Records in the Department offices are confidential and as such you are not allowed access to your complete graduate folder without permission of the Department Head or Associate Head Graduate Programs, subject to TAMU System guidelines. If you would like to view any of the information in your folder, you may ask the Associate Head's Administrative Assistant, who will make you a copy of the appropriate materials when time permits. Confidential letters of reference, evaluations, etc. will not be copied if the prospective student has signed a waiver of the right to view those documents.

**FINAL COMMENT:**
Every attempt is made to meet the needs of individual students. You are encouraged to discuss your goals and objectives fully with your Graduate Advisor, Advisory Committee, Department Head, or Associate Head for Graduate Programs. Solicit the help of the Associate Head for Graduate Programs if the Department, College or University policies are unclear or if you feel a policy is in conflict with your objectives. Suggestions for changes, additions or deletions to all policies are welcomed. Your views and suggestions are taken seriously by the Department and have a real impact on formulating Departmental policies. Therefore, please speak up when you feel it is appropriate. Communication is the key to a successful graduate program.

**Table 1. Minimum $^2$ and maximum $^3$ registration requirements**

<table>
<thead>
<tr>
<th>Student Status</th>
<th>Each Fall and Spring Semester</th>
<th>For Entire Summer$^3$</th>
<th>10-Week</th>
<th>SSI / SSII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistantship (research/teach)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) State Funds</td>
<td>9</td>
<td>13</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>2) Grants/Contracts</td>
<td>9</td>
<td>13</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Fellowship</td>
<td>9</td>
<td>16</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>International Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Self Supported</td>
<td>9</td>
<td>16</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>2) Government Support</td>
<td>9</td>
<td>16</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Self-supported</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) On-Campus entire or portion of semester</td>
<td>1</td>
<td>16</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>2) In Absentia Registration</td>
<td>1</td>
<td>16</td>
<td>1</td>
<td>14</td>
</tr>
</tbody>
</table>
3) Off campus registration

<table>
<thead>
<tr>
<th></th>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>William McKinley</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jim Johnson (retired)</td>
<td></td>
<td></td>
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<tr>
<td>Jayne Zajicek</td>
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</tbody>
</table>

4) Full-time Employee

<table>
<thead>
<tr>
<th></th>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luis Cisneros-Zewallos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhimu Patil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al Wagner</td>
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</tbody>
</table>

Thesis/Dissertation cleared by Thesis Clerk by 1st class day

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<tr>
<th></th>
<th>On-Campus</th>
<th>Off-Campus</th>
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<tbody>
<tr>
<td>0</td>
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</tbody>
</table>

All graduate students must maintain a minimum continuous enrollment of 1 credit hour each fall, spring and summer (all 10 weeks) semester(s) from the semester of first enrollment until the semester of graduation, unless 1) a Leave of Absence is granted, 2) a Minimum Registration Request is granted (for example, full-time employees), or 3) thesis or dissertation is cleared by Thesis Clerk before the start of the semester of graduation.

Requests to exceed the maximum registration requires a petition approved by the Department and OGS.

Minimum summer enrollment requirements for students on assistantships and fellowships is 6 hours in any combination.

Full-time employees must fill-out a Minimum Registration Form if 0 credit hours registration is chosen.

### Table 2. Graduate faculty listed by area of specialization and (degrees that can be obtained under their direction).

#### Floral Design and Event Planning (Horticulture)

- On-Campus: William McKinley, Jim Johnson (retired), Jayne Zajicek
- Off-Campus

#### Food Science & Technology / Bioactive Compounds / Postharvest Physiology (Horticulture, Food Science)

- On-Campus: Luis Cisneros-Zewallos, Bhimu Patil, Al Wagner
- Off-Campus

#### Greenhouse / Floriculture Production and Marketing (Horticulture)

- On-Campus: Charles Hall, Terri Starman
- Off-Campus: Brent Pemberton (Overton)

#### Horticulture Information Technology (Horticulture)

- On-Campus: Dan Lineberger
- Off-Campus

#### International Horticulture (Horticulture)

- On-Campus: Tim Davis, Fred Davies, Raul Cabrera, Leonardo Lombardini, Mengmeng Gu, Bhimu Patil
- Off-Campus: Daniel Leskovar (Uvalde)

#### Nursery / Floriculture Economics (Horticulture)

- On-Campus: Charles Hall
- Off-Campus

#### Ornamental Horticulture / Landscape Plant Establishment / Landscape Plant Development (Horticulture, MEPS, Plant Breeding)

- On-Campus: Michael Arnold
- Off-Campus: Raul Cabrera (Uvalde)
<table>
<thead>
<tr>
<th></th>
<th>Steve George (Dallas)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Genhua Niu (El Paso)</td>
</tr>
<tr>
<td>Astrid Volder</td>
<td>Brent Pemberton (Overton)</td>
</tr>
<tr>
<td>Douglas Welsh (retired)</td>
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</tbody>
</table>

**Plant Microorganisms / Pathology (Horticulture)**

<table>
<thead>
<tr>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elizabeth Pierson</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2. continued

#### Plant Physiology (Horticulture, MEPS)

<table>
<thead>
<tr>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gregory Cobb</td>
<td>Raul Cabrera (Uvalde)</td>
</tr>
<tr>
<td>Fred Davies</td>
<td>John Jifon (Weslaco)</td>
</tr>
<tr>
<td>Hisashi Koiwa</td>
<td>Daniel Leskovar (Uvalde)</td>
</tr>
<tr>
<td>Leonardo Lombardini</td>
<td>Genhua Niu (El Paso)</td>
</tr>
<tr>
<td>David Reed</td>
<td>Kendal Hirschi (Baylor)</td>
</tr>
<tr>
<td>Patricia Klein</td>
<td></td>
</tr>
<tr>
<td>Elizabeth Pierson</td>
<td></td>
</tr>
<tr>
<td>Terri Starman</td>
<td></td>
</tr>
<tr>
<td>Astrid Volder</td>
<td></td>
</tr>
</tbody>
</table>

#### Plant Breeding and Genetics (Horticulture, Plant Breeding)

<table>
<thead>
<tr>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Byrne</td>
<td>L.J. Grauke (USDA, College Station)</td>
</tr>
<tr>
<td>Kevin Crosby</td>
<td>Tommy Thompson (USDA, College Station)</td>
</tr>
<tr>
<td>Patricia Klein</td>
<td>Xinwang Wang (Dallas)</td>
</tr>
<tr>
<td>Creighton Miller (retired)</td>
<td>Eliezer Louzada (Weslaco)</td>
</tr>
<tr>
<td>Richard Jones (adjunct)</td>
<td></td>
</tr>
</tbody>
</table>

#### Sociohorticulture / People: Plant Interactions (Horticulture)

<table>
<thead>
<tr>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jayne Zajicek</td>
<td>Tina Waliczek Cade (adjunct)</td>
</tr>
</tbody>
</table>

#### Sustainable Horticulture Production / Nursery Production (Horticulture)

<table>
<thead>
<tr>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Arnold</td>
<td>Raul Cabrera (Uvalde)</td>
</tr>
<tr>
<td>Mengmeng Gu</td>
<td></td>
</tr>
</tbody>
</table>

#### Vegetable Production (Horticulture)

<table>
<thead>
<tr>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe Masabni</td>
<td>John Jifon (Weslaco)</td>
</tr>
<tr>
<td>Richard Jones (adjunct)</td>
<td>Don Henne (Weslaco)</td>
</tr>
<tr>
<td>Creighton Miller (retired)</td>
<td>Daniel Leskovar (Uvalde)</td>
</tr>
<tr>
<td></td>
<td>Gene Lester (USDA, Weslaco)</td>
</tr>
<tr>
<td></td>
<td>Shad D. Nelson (Kingsville)</td>
</tr>
</tbody>
</table>

#### Viticulture / Enology (Horticulture)

<table>
<thead>
<tr>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gregory Cobb</td>
<td>Edward Hellman (Lubbock)</td>
</tr>
<tr>
<td>George Ray McEachern (retired)</td>
<td></td>
</tr>
</tbody>
</table>

### DEGREES OFFERED THROUGH THE DEPT. OF HORTICULTURAL SCIENCES

<table>
<thead>
<tr>
<th>Horticulture</th>
<th>M.Ag.</th>
<th>M.S.</th>
<th>Ph.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Campus</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

#### Notes

- M.Ag = Master of Agriculture - Non-Thesis, Internship and internship summary paper required
- M.S. = Master of Science - Thesis required
- Ph.D. = Doctor of Philosophy - Dissertation required

- Degrees obtained under the direction of off-campus faculty, require a co-advisor on campus for the student’s benefit while they are on-campus completing coursework.
### Table 3. Projected graduate course offerings by the Department of Horticultural Sciences.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sp</td>
<td>Su</td>
<td>F</td>
<td>Sp</td>
</tr>
<tr>
<td>HORT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>604 Applied Physiology of Horticultural Plants</td>
<td>LL</td>
<td>LL</td>
<td>LL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>605 Internet Technology for Horticulture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>608 Plants for Landscape Design</td>
<td>MA</td>
<td>MA</td>
<td>MA</td>
<td>MA</td>
<td>MA</td>
</tr>
<tr>
<td>609 Plants for Landscape Design II</td>
<td>MA</td>
<td>MA</td>
<td>MA</td>
<td>MA</td>
<td>MA</td>
</tr>
<tr>
<td>610 Physiological &amp; Molecular Basis for Plant Stress Response</td>
<td>HK</td>
<td>&amp;</td>
<td>LL</td>
<td>HK</td>
<td>&amp;</td>
</tr>
<tr>
<td>611 Ecology of Urban Landscapes</td>
<td></td>
<td></td>
<td>AV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>618 Root Biology</td>
<td>AV</td>
<td></td>
<td>AV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>689 Science of Foods for Health</td>
<td></td>
<td>BP</td>
<td>BP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>626 International Floriculture Marketing</td>
<td></td>
<td>TS &amp; CH</td>
<td>TS &amp; CH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>640 Phytochemicals in Fruits and Vegetables to Improve Health</td>
<td>BP</td>
<td>BP</td>
<td>BP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>630 Postharvest Biology</td>
<td>LC</td>
<td></td>
<td>LC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>681 Seminar</td>
<td>AV</td>
<td>AV</td>
<td>AV</td>
<td>AV</td>
<td>LC</td>
</tr>
<tr>
<td>689 Plant Associated Microorganisms</td>
<td>EP</td>
<td></td>
<td>EP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


### Form 1. Example of the form used to request registration below the minimum.

**Minimum Registration Request**

**Department of Horticultural Sciences**

All graduate students are required to maintain continuous enrollment during their graduate program.

Fill out this form if you wish to register for hours below the required minimum of 1 credit each semester. **Students on assistantships and fellowships cannot register below the minimum required.** You may also use this form to request a leave of absence. Submit the completed form to the Associate Head for Graduate Programs prior to the first day of classes for each requested semester.

Semester ___________________________ Credit Hour Request ___________________________

**STUDENT INFORMATION**

NAME ______________________________________ MAJOR_______________________

CLASSIFICATION __________________________ DEGREE SOUGHT ________________

LOCAL TELEPHONE __________________________

**JUSTIFICATION**

_________________________________________
<table>
<thead>
<tr>
<th>Student’s Signature</th>
<th>Graduate Advisor’s Signature</th>
</tr>
</thead>
</table>

Approved:

<table>
<thead>
<tr>
<th>Associate Head for Graduate Program’s Signature</th>
<th>Date</th>
</tr>
</thead>
</table>
Form 2. Example of professional paper approval page.

**TITLE OF PROFESSIONAL PAPER IN BOLD CAPS**

A PROFESSIONAL PAPER

By

(Insert name of student here)

Approved as to style and content by:

Dr. (Insert name), Department Head

Dr. (insert name), Committee Chair

Dr. (insert name), Committee Member or Co-chair

Dr. (insert name), Committee Member
Form 3. Example of research proposal title page for thesis, dissertation, or record of study consult the OGS website for the latest version.

OFFICE OF GRADUATE STUDIES
PROPOSAL TITLE PAGE FOR
THESIS, DISSERTATION, OR RECORD OF STUDY

Date: ______________________

I submit for approval the following research proposal for my: (check one) □ thesis □ dissertation □ record of study.

Major: ______________________

Tentative Title: ________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

There are compliance issues that must be addressed if graduate students are performing research involving human subjects, animal, and recombinant DNA. Students involved in these types of research must check with the Research Compliance Division, Office of the Vice President for Research at 970.445.3585 to ensure that they have met all compliance responsibilities. Additional information can also be obtained at http://ypr.umn.edu/policy.html.

A copy of appropriate research compliance approval form must be attached when proposal is submitted.

Approval Recommended:

Name: ______________________ Dept: ______________________ Student's Signature: ______________________

Committee Chair *

Name: ______________________ Dept: ______________________ Student(s) Name: ______________________

Member

Name: ______________________ Dept: ______________________ Student(s) ID Number: ______________________

(Member)

Name: ______________________ Dept: ______________________ Mailing Address: ______________________

(Member)

Name: ______________________ Dept: ______________________ Name: ______________________ Dept: ______________________

(Member)

Name: ______________________ Dept: ______________________ Date of Approval: ______________________

(Member)

Name: ______________________ (Department Head OR Intercollegiate Faculty Chair) *

For the Office of Graduate Studies

* I certify that all research compliance requirements have been addressed prior to submission of this proposal.
Form 4. Example title page for a thesis from OGS (see http://ogs.tamu.edu/current-students/thesis-dissertation/).

THE DEVELOPMENT AND IMPROVEMENT OF INSTRUCTIONS FOR GRADUATE STUDENTS

A Thesis

by

JOHN PHILIP SMITHERS

Submitted to the Office of Graduate Studies of Texas A&M University in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Approved by:

Chair of Committee, Charles Doakes
Committee Members, John J. Anderson
                                       David Benner
                                       Harold B. Morton
Head of Department, Darla J. Marsh

December 20XX

Date is month and year of graduation.

Major Subject: Educational Administration

NOTE: There are NO signatures on this page. The “Approval of Written Thesis” form to be signed is available at Thesis Office website.
Graduation Checklist (see http://graduation.tamu.edu)

The following is a general list of items adapted from OGS recommendations (the Department does not imply that this is everything a student needs to do) that a student will need to complete in order to graduate. Students are expected to refer to the current Graduate Catalog (see OGS website) for issues related to your specific degree.

1. Apply for graduation by the deadline published on the OGS website.
2. Order your academic regalia by the published deadline.
3. Familiarize yourself with the OGS deadline calendar and meet all deadlines.
4. Run a degree audit on http://howdy.tamu.edu. Discuss any concerns with your advisor, the Associate Department Head for Graduate Programs, or OGS as appropriate.
5. Finalize your degree plan. Submit any petitions needed to correct deficiencies. Confirm that any incomplete grades have been changed to letter grades or back to an incomplete.
6. Schedule your final oral exam by the posted OGS deadlines.
7. Advertise the location, time and date of your exit seminar within 1 and 2 weeks of the seminar and notify the Department of such as indicated in this policy manual.
8. Submit your thesis or dissertation to the Thesis Office by the posted OGS deadlines.
9. Obtain all necessary original signatures from your graduate committee and the Department and submit your thesis or dissertation revisions to the Thesis Office in time for them to clear before the posted deadlines. M. Ag. students should submit the paper copy of the original signed signature page for your internship paper and an electronic copy of the internship paper on CD to the Associate Head for Graduate Programs prior to the last Friday of regular classes.
10. Clear your academic record. Confirm that all incomplete grades have been converted to the appropriate grades.
11. Satisfy all financial obligations with Texas A&M University.
12. If you plan to continue for another graduate degree at TAMU, submit a Letter of Intent to the OGS.
Byline
This version of the Graduate Policy Manual for the Texas A&M University Department of Horticultural Sciences was revised and updated in October 2012 by Michael A. Arnold from the original versions written by David Wm. Reed and subsequently updated by Michael Arnold or David H. Byrne, with assistance from Carol Nesbitt. All materials in this departmental graduate policy manual are subordinate to policies set forth by the Texas A&M University System, Texas A&M University, the Texas A&M University College of Agriculture and Life Sciences, and the TAMU Office of Graduate Studies as well as all local, state, and federal regulations. Programmatic issues at the Department level represent decisions reached by the TAMU Department of Horticultural Sciences Graduate Faculty as a whole, while other policy issues are the results of guidelines from governing entities above the Department level or were determined by the Associate Head for Graduate Programs in consultation with the Department Head and College Administration. Please forward suggestions and corrections to this manual to the attention of the Associate Head for Graduate Programs, Texas A&M University, Department of Horticultural Sciences, College Station, TX 77843-2133.
Appendix 5.1. Horticultural Sciences Departmental Promotion and Tenure Policy

DEPARTMENTAL PROMOTION AND TENURE POLICY
Department of Horticultural Sciences
Texas A&M University
(Revised and approved September 23, 2009; January 11, 2013)

Sections
Introduction 1
I. Definition of Faculty, Rights and Privileges 2
II. Composition, Voting and Tenure on the Promotion and Tenure Committee 3
III. Timing of Reviews 6
IV. Mid-Term Review (3-Year Review for 7-Year Probationary Period) 8
V. Promotion and Tenure Review 10
VI. Post-Tenure Review 25

Introduction
The Texas A&M Department of Horticultural Sciences is judged by the quality of its academic, extension and research programs and the total professional contributions of its faculty. For this reason, the Department of Horticultural Sciences seeks to hire and retain faculty members who develop distinguished teaching programs, at the graduate and undergraduate levels, develop distinguished research and/or extension programs, and share their time and professional expertise in service both within and outside of the Texas A&M University System (TAMUS).

In order to increase the probability of retaining outstanding faculty, various guidelines and policies for promotion and tenure have been developed. The policies and procedures for promotion and/or tenure set forth in this document apply to both tenure-track and non-tenure-track faculty within the Department of Horticultural Sciences on the Texas A&M University campus and at off-campus locations.

These guidelines are intended to inform candidates concerning the expectations of the faculty of the Department of Horticultural Sciences and the procedures for promotion and tenure within this program. In all cases, the policies and procedures of Texas A&M University College of Agriculture and Life Sciences, Texas AgriLife Research and Texas AgriLife Extension supersede those contained herein. Candidates are urged to familiarize themselves thoroughly with the policies and procedures of the appropriate system part(s) and to exercise due diligence in adhering to deadlines and expectations. The Rules for TAMU are set forth in University Rule 12.01.99.M2 - University Statement on Academic Freedom, Responsibility, Tenure, and Promotion. The Dean of Faculties Office publishes yearly guidelines and the process to follow for that year.

I. Definition of Faculty, Rights and Privileges

Consistent with Texas A&M University College of Agriculture and Life Sciences, Texas AgriLife Research, and Texas AgriLife Extension policy, to be considered a faculty member of the Department of Horticultural Sciences, an individual must hold one of the following titles:
Professor
Associate Professor
Assistant Professor
Research Professor
Research Associate Professor
Research Assistant Professor
Adjunct Professor
Adjunct Associate Professor
Adjunct Assistant Professor
Visiting Professor
Visiting Associate Professor
Visiting Assistant Professor
Instructor
Lecturer
Senior Lecturer
Distinguished Lecturer
Assistant Lecturer

Rights and Privileges of Faculty Members
All faculty members should receive communications intended for “faculty” and are invited to participate in faculty meetings. To be a voting member of the faculty, individuals must be adloc’d to the Department of Horticultural Sciences (with a title of Professor, Associate Professor, Assistant Professor, Instructor, Lecturer, Senior Lecturer, or Distinguished Lecturer), and have Horticultural Sciences designated as their home department (as in the case of off-campus Texas AgriLife Research appointments), and have no modifiers in their professorial titles. Therefore, Adjunct, Visiting, and Research modifiers are non-voting faculty members. Issues which require a faculty vote typically include department-wide issues (e.g. hiring of a new faculty member or Head, changes in departmental policy). In addition, for agency (TAMU COALS, Texas AgriLife Research, Texas AgriLife Extension) specific issues, votes may be taken that are restricted to faculty that carry those agency appointments.

II. Composition, Voting and Tenure on the Promotion and Tenure Committee

The Promotion and Tenure Committee is composed of all full Professors in the Department of Horticultural Sciences, including Professors with TAMU, Texas AgriLife Research and Texas AgriLife Extension appointments, both on-campus and off-campus, but not including Professors with modifiers (Research, Visiting or Adjunct). There will be a minimum of 2 full Professors each from the following categories:

A. On-campus, TAMU or joint Texas AgriLife Research-TAMU or joint Texas AgriLife Extension-TAMU appointments
B. On-campus, Texas AgriLife Extension appointment
C. Off-campus, Texas AgriLife Research appointment
D. Off-campus, Texas AgriLife Extension appointment

If no or only one full Professor in any of these categories exists in the current Department of Horticultural Sciences and/or off-campus units, then the remaining slot(s) in the category(ies) will be filled by an Associate Professor(s) from the deficient category as recommended by the T&P Committee and appointed by the Department Head.

Voting
The whole committee will vote on matters related to promotion with the following exceptions. Associate Professors cannot participate in decisions regarding promotion to full Professor.

When tenure considerations are made, all committee members may participate in discussion of the candidate's credentials and all members may register a vote. The vote will be reported separately for tenured committee members and non-tenured and/or non-tenure-track committee members. As per TAMU policy, only the vote of committee members already holding tenure will be reported as the formal tenure vote.

The Chair of the P&T Committee will tally votes, communicate committee decisions to the department head, and communicate the department head's comments to the committee.

Abstain, Absent and Recuse Votes
The committee should attempt to minimize abstain and absent votes in order for the committee’s recommendation to carry maximum influence as the packets move forward through the process. Recuse votes should be used sparingly, and for valid reasons that compromise one’s decision.

Tenure on Departmental Promotion and Tenure Committee
Appointment to the Departmental Promotion and Tenure Committee is permanent, but contingent on participation as follows:

- If a committee member fails to participate and register a vote in tenure and promotion considerations for two consecutive academic years, then they will be removed from the committee. Abstain or absent votes do not constitute a participating vote. A recuse vote (given a valid reason) does constitute a participating vote.
- Two years after removal, the faculty member will regain eligibility, and may be re-appointed to the committee by petition to the Head.

III . Timing of Reviews

Tenure and Promotion from Assistant to Associate Professor

The general time line for reviews is as follows (exact dates will vary from year to year): March-May, candidate solicits input on dossier from senior faculty members; mid-June, candidate submits dossier and names of possible external peer reviewers to the Department Head; mid-August, dossier is assembled in preparation for going to the Department Promotion and Tenure Committee; early to mid-September, Department Promotion and Tenure Committee convenes and votes on cases; late September, Department Promotion and Tenure Committee report and Department Head letter is submitted to Dean’s or Director’s offices. Candidates are strongly encouraged to seek input from their mentoring committee and other senior faculty members regarding the timing for submitting their dossiers.

Any individual hired in a tenure-track position will be required to submit materials for review during the academic year prior to the end of their probationary period. The exact timing of this depends upon the length of the probationary period (see the formula below or as superceded by TAMU system policy). The start of a tenure-track faculty member’s mandatory consideration year (academic year) can be calculated as follows:

Calendar year hired + Probationary period – 2 years = Tenure Consideration Year

For example, for a faculty member hired in 2009:

<table>
<thead>
<tr>
<th>If probationary period is:</th>
<th>Mid-Term Review will occur between:</th>
<th>Mandatory Tenure Review (at all levels) will occur:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 years</td>
<td>Mar – Dec 2012</td>
<td>2014/15</td>
</tr>
<tr>
<td>6 years</td>
<td>Mar – Dec 2011 (encouraged)</td>
<td>2013/14</td>
</tr>
<tr>
<td>5 years</td>
<td>Mar – Dec 2011 (encouraged)</td>
<td>2012/13</td>
</tr>
<tr>
<td>4 years</td>
<td>Mar – Dec 2010 (encouraged, but usually not done)</td>
<td>2011/12</td>
</tr>
<tr>
<td>3 years</td>
<td>N/A</td>
<td>2010/11</td>
</tr>
</tbody>
</table>

NOTES:

1) Semester of hire does not necessarily constitute “hire year.”
2) The probationary period will be found in the faculty member’s original letter of hire.
3) The Board of Regents will review recommendations in the spring semester of the tenure consideration year.
4) See the separate Guidelines for Annual and Midterm Reviews for more information about midterm review timing.
A faculty member must be informed of a negative tenure decision at least 1 year before the termination of employment (except in the case of financial exigency as defined by TAMU System policy).

Promotion from Assistant to Associate Professor, with or without the granting of tenure, will take place prior to the beginning of the last probationary year (i.e. going up for tenure and/or promotion early) only in exceptional cases. Such an action recognizes the accomplishments of the faculty member in making unusually quick progress in the development of teaching, research or extension programs.

**Promotion from Associate Professor to Professor**

There is no set schedule for consideration of promotion from Associate Professor to Professor. The timing should be part of the discussion between the faculty member and the Head, Resident Director or Associate Head for Texas AgriLife Extension during the Annual Review. Twelve total years in rank (Assistant plus Associate) would be a typical time in rank to begin the discussion on timing of promotion to Professor; however, the exact timing is dependent on the progress and accomplishments of the faculty member.

**IV. Mid-Term Review**

(3-Year Review for 7-Year Probationary Period)

The Mid-Term Review often is referred to as “3rd Year Review” because many tenure-track faculty are hired with a 7 year probationary period; therefore, the mid-term review would take place in the third year. Tenure-track faculty with a probationary period of 7 years are required (by University Rule 12.01099.M2) to have a Mid-Term Review. Tenure-track faculty with a probationary period between 4 and 6 years are encouraged to have a Mid-Term Review. Unless the appointment letter states otherwise, the probationary period in the department will be 7 years. See the previous table on Timing of Review for the when the Mid-Term Review is to be conducted.

**Purpose of Mid-Term Review**

The purpose of the Mid-Term Review is mentoring. The decisions and opinions of the Head, Resident Director, Associate Head, and Tenure and Promotion Committee are not terminal. The Mid-Term Review informs faculty members as to how they are progressing towards promotion and/or tenure, and in sufficient time in advance to allow the faculty member to correct deficiencies. The Annual Review by the Head, Resident Director or Associate Head for TCE allows annual mentoring. The Mid-Term Review gives candidates an indication as to how the Tenure and Promotion Committee views their progress towards promotion. Candidates are expected to confer with their mentoring committee in preparation for the mid-term review.

**Mandatory for all Faculty – TAMU, AgriLife Research and AgriLife Extension**

Mid-Term Reviews are mandatory for TAMU faculty with seven year probationary periods. Since the main purpose of the Mid-Term Review is mentoring, departmental policy also requires Mid-Term Reviews for Texas AgriLife Research and Texas AgriLife Extension faculty, both on-campus and off-campus.

**Mid-Term Review Process**

The Mid-Term Review should be similar to the tenure/promotion review process, including the submission of a dossier. However, no outside letters are sought; but internal letters of recommendation can be included. The Mid-Term Review packet is put together according to the Guidelines for Tenure and Promotion Packages for that year (http://dof.tamu.edu/admin/tp/tenure_guide.doc)

At the discretion of the Head, Resident Director or Associate Head for Texas AgriLife Extension, the Mid-Term Review can take the place of the Annual Review during the year of the Mid-Term Review. The Mid-Term review package goes only to the level of Dean of the College, or Directors of Texas AgriLife Research or Texas AgriLife Extension.
V. Promotion and Tenure Review
(http://dof.tamu.edu/)

Eligibility for Promotion and Tenure

To be eligible for tenure consideration, an individual must hold the title of Instructor, Assistant Professor, Associate Professor, Professor or Distinguished Professor, and have a minimum salaried appointment of 33% on a 9-month basis (25% on a 12-month basis) with Texas A&M University (TAMU). Persons with majority appointments with the Texas AgriLife Research, Texas AgriLife Extension, or with joint appointments with less than 33% funding on a 9-month basis, or 25% on a 12-month basis through TAMU are eligible for professorial rank, but are not eligible for tenure consideration. Lecturers, Senior Lecturers, Visiting, Adjunct, and Research Professors of any rank, graduate students serving as teaching assistants, post-doctoral fellows, technicians or Research Scientists are not eligible for tenure consideration and are evaluated annually for reappointment by the department head or his/her designate.

New faculty members who have only recently earned terminal degrees or have only postdoctoral training, are accorded a probationary period not to exceed 7 years during which they must demonstrate competence for promotion, and if the position is on the tenure-track, for the awarding of tenure. The duration of this probationary period must be clearly stated in the initial letter of offer and is governed by the policies of Texas A&M University. Persons with prior appropriate full time service at other institutions of higher education may be accorded lesser probationary terms. Under certain circumstances, advanced professorial rank and tenure or advanced professional rank and tenure probation may be awarded during the process of hiring. Typically, hiring of faculty at advanced professorial rank or granting of tenure upon hiring only will be considered if the individual currently possesses that rank and/or tenure at another institution of higher education, and in all cases, the Department of Horticultural Sciences Promotion and Tenure Committee will vote on this action.

Assistant Professors in the tenure-track will not be recommended for promotion without also being recommended for tenure. Associate Professors in tenure-track positions, hired without tenure, may have a maximum of 7 years to qualify for tenure as agreed upon at the time of hiring. The awarding of tenure to an Associate Professor is not always accompanied by promotion to Professor.

Promotion of tenured faculty from Associate Professor to Professor will be based on the documentation of distinguished achievement in teaching, research and extension/professional/public service activities. Consideration may be given to promotion of an individual whenever criteria as set forth in the following section are met.

There are four ways in which candidates to be considered for promotion and/or tenure may be identified:

1. As mandated by the probationary period.
2. By recommendation of the Department Head or Resident Director;
3. By the Department of Horticultural Sciences Promotion and Tenure Committee;
4. By the request of the individual faculty member;

Except with the mandatory probationary period, the candidate is ultimately the person who makes the decision as to when consideration for promotion will occur. This decision should be made after strongly considering the advice from their mentoring committee, other senior faculty members and the Department Head.

Criteria for Promotion and the Awarding of Tenure

General Policy

The criteria for promotion and for the awarding of tenure (if on the tenure-track) in the Department of Horticultural Sciences are identical, that is, tenure or promotion is recommended only if the candidate clearly meets the criteria for promotion not only among others in the Program, but also in comparison with scientists throughout the System and those at peer institutions with horticulture programs.
**Assistant Professor**

The rank of Assistant Professor usually pertains to an initial appointment, rather than a promotion.

Qualifications for appointment to this rank include receipt of the terminal degree in the discipline, high potential for future teaching, research or extension programming ability, which is based on evaluation of service as a teaching assistant and/or instructor, the candidate's dissertation or other written evidence of original research, prior involvement in extension programming activities, or prior service as an Assistant Professor at another institution.

An Assistant Professor with a teaching appointment will have responsibility for teaching undergraduate and/or graduate courses and for assisting in course and curriculum development, may supervise the efforts of undergraduate and graduate student assistants, assist student organizations within the Department, College or University, and, as a member of the graduate faculty, advise graduate students and serve on graduate student committees. The Assistant Professor may also assume major responsibility for supervising graduate students who are completing theses or dissertations, and may serve as a member of College and/or University committees. The Assistant Professor with a joint research or extension appointment will also have a responsibility to develop a productive research or extension program, to seek external support for such programs and publish the results of these efforts, to advise students on curricular and career choices, engage in public service activities and serve on faculty committees. The Assistant Professor will develop scholarly maturity as evidenced by professional achievement, such as publication of research results in refereed journals, and by creative and effective teaching or extension activities.

**Mentoring Committee:** A Mentoring Committee will be assigned by the Department Head to all new Assistant Professors within one year of employment. The Mentoring Committee normally will consist of two to four senior faculty (Associate Professor or Professor) who have experience relevant to the new Assistant Professor. Once the Mentoring Committee is assigned, it is the responsibility of the new faculty member to communicate with them on a regular basis regarding professional development activities and progress towards promotion. One member of the Mentoring Committee will assume the role of primary contact. The Assistant Professor is encouraged to solicit an annual review of their progress from the mentoring committee.

**Associate Professor**

Appointment or promotion to the rank of Associate Professor requires evidence of superior ability as a teacher, researcher and/or extension professional. The demonstration of a substantive research or extension program, excellence in classroom instruction, and publications that reflect one's original contributions are required for advancement to this grade. Other professional and scientific activities, as well as involvement in departmental improvement programs, are positive factors.

The Associate Professor with a teaching appointment will be responsible for teaching undergraduate and/or graduate courses, and for assisting in course and curriculum development. The Associate Professor must have demonstrated skill in teaching undergraduate and/or graduate courses, must have received favorable evaluations from students and departmental administrators, and must have demonstrated a sincere interest in working with students. If assigned research responsibilities, he/she should manifest a high degree of scholarly maturity by conducting research programs of a high caliber in a disciplinary or commodity specialty, by seeking external support for such research, and by publishing the results of these efforts. If assigned extension responsibilities, the individual should have organized an effective extension program to include publications, media development, programs, workshops, and collaborative efforts with county extension professionals, and other means considered appropriate to a comprehensive program. The Associate Professor with teaching and/or research appointments will assume major responsibility for supervising graduate students who are completing theses or dissertations, and may serve as a member of college, university, or agency committees. He/she might have other responsibilities, as assigned by the Department Head. He/she may also be responsible for serving as a resource person for appropriate commodity groups, and for undertaking leadership roles in appropriate professional organizations at the state, regional, or national level.

**Professor**
Appointment or promotion to the rank of full Professor requires evidence of superior and sustained performance as a teacher, researcher and/or extension professional. Some individuals are better teachers than others, just as some are better researchers than others. The combination of these principal academic functions, at a level of superiority and as appropriate to the appointment, is required of a full Professor. The Professor must have achieved national/international recognition for scientific accomplishment or creative activity. In addition, significant contributions are expected by way of faculty governance and visible participation in national academic and scientific affairs.

The Professor should be recognized as a highly competent professional in his/her discipline, should also have a record of success in assigned teaching, research or extension responsibilities and should continually strive for professional improvement.

Measures that weigh heavily in evaluation for promotion to this rank include quality of teaching; quality of theses and/or dissertations prepared under the candidate's active supervision; chairing/co-chairing Ph.D. student committees for those with on-campus research and teaching appointments; the candidate's own research productivity, quality of extension programming, grantsmanship, participation in departmental, college, Texas AgriLife Research, Texas AgriLife Extension, and university affairs, and leadership in the affairs of relevant professional and scientific organizations, and where appropriate, commodity organizations.

The Professor is responsible for providing leadership in developing the educational and/or research program(s) in his/her area of expertise and for attracting high-quality students. He/she assumes major responsibility for discharging successfully the tasks assigned to department, college, agency, and/or university committees. The Professor exhibits the highest caliber of instructional, extension programming, and/or scholarly skills, and is uniquely responsible for, and capable of, providing leadership for the overall good of the Texas A&M University System. As a seasoned and mature professional, the Professor contributes significantly to regional and national organizations. Likewise, the Professor is responsible for using his/her skills and reputation to advance the horticulture professions, and to seek ways in which the discipline can assist in improving the quality of life.

**Criteria for Evaluation**

All faculty are expected to develop distinguished teaching, research and/or extension programs, consistent with the expectations of their position descriptions and annual plans of work, and to serve their profession and TAMUS by participating on committees and in administrative functions as needed. Teaching, research and extension performance will be evaluated with respect to the proportion of budgeted time assigned to each activity. However, the major emphasis for evaluation will be on the quality and balance of effort in the individual's overall academic and professional programs. The criteria for evaluation are (in no particular order of importance):

1. **Criteria for the Teaching Function**
   a. Superior teaching performance in the classroom based on student evaluation, etc.
   b. Development of innovative and effective instructional approaches, materials, books, manuals, and techniques
   c. Development of new academic programs
   d. Incorporation of activities and instructional materials that enhance students’ exposure to diversity and international awareness and/or increase the students’ involvement in interdisciplinary courses and curricula.
   e. Chairship/co-chairship of graduate advisory committees and direction of graduate programs, particularly Ph.D. students for those faculty with the rank Associate Professor or Professor
   f. Publication in educational journals
   g. Recipient of awards for teaching from the university and/or professional organizations
   h. Effective student advising
   i. Effective student recruitment

2. **Criteria for the Research Function**
   a. Evidence of independent research in a well-planned and developed program and/or a key role in strong multi-disciplinary research
b. Demonstration of significant contributions to interdisciplinary research collaborations involving faculty with different departments in the College of Agriculture and Life Sciences, faculty in other colleges at Texas A&M University, or colleagues from other institutions. International and interdisciplinary collaborations which result in publication of scholarly works are encouraged.

c. Publication of research in scholarly and professional refereed journals

d. Publication of research in forms that are targeted for user groups

e. Recipient of awards for excellence in research

f. Significant research funding from external sources

g. Presentation of invited papers at regional, national, or international professional and scientific meetings

h. Maintenance of effective relationships with research user groups

i. Evidence that research has contributed to the advancement of knowledge or has produced a tangible benefit to society, e.g., improved crop variety

j. Chairship/co-chairship of graduate advisory committees and direction of graduate programs, particularly Ph.D. students for those faculty with the rank Associate Professor or Professor

3. Criteria for the Extension Function

a. Evidence of leadership in extension programming, as judged by substantial impact on clientele served

b. Quantity and quality of extension materials including bulletins, pamphlets, fact sheets, electronic or multimedia presentations, videos, computer programs, newsletters, web pages and other educational works prepared by the individual

c. Quantity and quality of extension educational efforts in mass media

d. Quantity and quality of educational activities in service to individuals, county programs, and commodity groups

e. Participation in research, independently or in cooperation with others, and the subsequent publication of results in refereed journals and/or industry and trade journals

f. Demonstrate ability to obtain grant support from external sources

g. Presentation of invited papers at regional, national, or international industry, professional and/or scientific meetings

h. Maintenance of effective relationships with commodity groups

i. Receipt of awards, commendations, or other recognition indicative of excellence in scholarly or service activity

j. Evidence of effectively communicating research findings of TAMUS research personnel, or evidence of effective communication or cooperation with TAMUS or researchers from other institutions or entities.

4. Criteria for the Public Service Function

a. Service to the College, University, and System through committee assignments and leadership roles

b. Service to professional and scientific societies

c. Maintenance of strong working relationships with counterparts in the Department

d. Service to state, regional, and national levels of government

e. Service to students, student organizations, etc.

f. Presentation of technical information to commodity groups

5. Contributions to a Safe Workplace

Faculty must demonstrate an awareness of and their support for making the departmental environment a safe workplace for themselves, their employees, their students and the University community. Criteria to be assessed in this regard include completion of all mandated safety and risk management trainings, integration of safety instruction and accountability into classroom and laboratory instruction, on-the-job training of all employees and graduate students in appropriate safety measures to be taken in their research,
teaching, and extension programs, and correction of variances under their control noted in University safety inspections. No faculty member will receive an unqualified satisfactory performance evaluation who is deemed by the Department Head to be out of compliance with University training and safety guidelines.

International activities related to teaching, research and service toward the broadest mission of the TAMUS will be recognized as a contribution toward faculty professional development.

In addition, where appropriate, consulting is considered a recognition of unique abilities and programmatic excellence, and will be evaluated in the tenure and promotion processes. Consulting, when done in accordance with university/agency policy, improves academic competence and can bring recognition to the individual, Department and University.

Tenure and Promotion Responsibilities

Individual Responsibilities

Each faculty member has the responsibility to be aware of the criteria for tenure and promotion within the Department, College, University and System and to meet or exceed these criteria. Faculty members should insure that their annual achievement reports and plans of work are current and complete.

The faculty member being evaluated for tenure or promotion or both is responsible for accumulating the information for review as outlined by TAMU policy, and to ensure its accuracy and completeness. The faculty member is also responsible for timely submission of required documents to the appropriate administrative supervisor when requested.

Faculty members should also be prepared to provide a list of three to six peers (who are not their major Professor or former students) external to the University who can provide an evaluation of their merit for promotion and tenure. A similar list of industry leaders or clientele can also be submitted. The faculty member may submit a “do-not-contact” list, and letters from individuals on the “do-not-contact” list cannot be submitted to the Tenure and Promotion Committee. When called upon for evaluations, each referee will be provided with an up-to-date achievement report of the candidate. The department head or resident director will provide additional names and will select the group to be contacted. The group to be contacted will consist of approximately one third to half of the peers suggested by the faculty member and the remainder to be selected independently by the department head or resident director.

Department of Horticultural Sciences Responsibilities

All faculty will be reviewed yearly, based on their annual achievement reports, by the Department Head, Associate Department Head for Extension/Program Leader, and/or Resident Director, as appropriate. Assistant Professors will be comprehensively reviewed in their mid-term review with the timing depending upon their probationary period. Associate Professors and Assistant Professors will be evaluated by the Department Head, Resident Director and/or Associate Department Head for Extension/Program Leader and informed annually about their progress toward promotion and/or tenure. The role of the Promotion and Tenure Committee is advisory only. The Department Head (for TAMU or TAMU/Texas AgriLife Research), the Department Head in consultation with the Associate Department Head for Extension/Program Leader (for Texas AgriLife Extension) or the Resident Director in consultation with the Department Head (for off-campus Texas AgriLife Research) makes the recommendation for the Department of Horticultural Sciences. The faculty member has the right to seek counseling from the Promotion and Tenure Committee, as well as from the Department Head, Associate Department Head for Extension/Program Leader, Resident Director or Mentoring Committee, as appropriate.

Promotion & Tenure Review and Evaluation Process

Department of Horticultural Sciences Level Review

The dossier of candidates recommended for promotion and/or tenure will be reviewed by the Promotion and Tenure Committee, which will then vote on the recommendation. Only tenured committee members may vote on tenure decisions. The Department Head, the Department Head in consultation with the Associate Department Head for Extension/Program Leader or the Resident Director in consultation with the Department Head, as appropriate, will prepare his or her own recommendation, but must include
the vote of the Promotion and Tenure Committee in the recommendation and letter to the Dean or Director. After the vote and final decision is made, the Department Head (or Resident Director, in the case of off-campus Texas AgriLife Research personnel, or Associate Department Head/Program Leader in the case of Texas AgriLife Extension personnel) shall inform the candidate of the decision. The recommendation is then forwarded to the Vice Chancellor for Agriculture (who is the Dean, COALS and Director, Texas AgriLife Research) or the Director of Texas AgriLife Extension as appropriate.

**College, University, and System Level Review**
Reviews by promotion and tenure committees and/or administrators at the College, University, and System levels follow according to their current respective policies. Efforts will be made by the Unit Head to keep the candidate notified of the recommendations made at each step in the process in a timely manner. Only the Board of Regents can grant tenure. Promotion and tenure approved by the Board of Regents typically becomes effective the following September 1.

**Non Reappointment**
Since the probationary period consists of a series of one-year contracts, a decision not to reappoint an individual who is on probation can be made any time up to the year of the mandatory review. Non-reappointment should be considered if performance is unsatisfactory to the point that it is clearly unlikely the person will qualify for tenure, as neither party benefits from prolonging an unsatisfactory situation. Such a decision is made, of course, with great care and only in compelling circumstances. Please note that notification of non-renewal may be made in spite of a prior decision to extend the probationary period. However, once notification of non-renewal is made, no probationary period extension may be requested.

**Candidate’s Right to Withdraw**
At any point in the process, a candidate may elect to withdraw his or her name from further consideration. This must be a written request. In the case of mandatory tenure considerations, this will mean submitting a written resignation.

**Right of Appeal**
All appeals and grievances will follow the procedure as outlined (http://dof.tamu.edu/) in the Statement on Academic Freedom, Responsibilities, Tenure, and Promotion Policy cited in the Faculty Handbook.

**VI. Post-Tenure Review**
(http://www.tamut.edu/administrative/12.06.99.pdf)

Post-tenure review at Texas A&M University applies to tenured faculty members and is comprised of annual review of performance (University Rule 12.06.99.M1) and, in case of unsatisfactory performance as delineated in this policy, the construction of, and subsequent review of, performance in a professional development plan.

As specified in University Rule 12.06.99.M1, annual reviews of performance are to be conducted for all faculty; must result in a written document of expectations for each faculty member, commensurate with his or her rank and seniority; and provide that evaluations of performance in scholarship, teaching, service, and other assigned responsibilities be made in writing. In order for annual review to be an integral part of post-tenure review, it will have these additional characteristics:

1. In each department, stated criteria for categories of performance to be assessed in the annual review will be established by departmental faculty and approved by the department head and dean. The categories established will range from a level deemed most meritorious to one deemed unsatisfactory by departmental standards.
2. An annual review finding unsatisfactory performance shall state the basis for finding unsatisfactory performance in accordance with the criteria.

3. A report to the dean of unsatisfactory performance as assessed by annual review will be accompanied by a written plan for near-term improvement

**Criteria for Categories of Performance to be Assessed in Annual Review**

1. Criteria for the Teaching Function
   a. Superior teaching performance in the classroom based on student evaluation, etc.
   b. Development of innovative and effective instructional approaches, materials, books, manuals, and techniques; development of new academic programs
   c. Chairship/co-chairship of graduate advisory committees and direction of graduate programs, particularly Ph.D. students for those faculty with the rank Associate Professor or Professor
   d. Publication in educational journals
   e. Recipient of awards for teaching from the university and/or professional organizations
   f. Effective student advising; effective student recruitment

2. Criteria for the Research Function
   a. Evidence of independent research in a well-planned and developed program and/or a key role in strong multi-disciplinary research
   b. Publication of research in scholarly and professional refereed journals; publication of research in forms that are targeted for user groups
   c. Recipient of awards for excellence in research
   d. Significant research funding from external sources
   e. Presentation of invited papers at professional and scientific meetings
   f. Chairship/co-chairship of graduate advisory committees and direction of graduate programs, particularly Ph.D. students for those faculty with the rank Associate Professor or Professor

3. Criteria for the Extension Function
   a. Evidence of leadership in extension programming, as judged by substantial impact on clientele served and or relationship within commodity groups.
   b. Development of extension materials including bulletins, pamphlets, fact sheets, electronic or multimedia presentations, videos, websites, computer programs, newsletters, mass media and other educational works prepared by the individual
   c. Development of educational activities in service to individuals, county programs, and commodity groups
   d. Participation in research, independently or in cooperation with others, and the subsequent publication of results in refereed journals and/or industry and trade journals; evidence of effectively communicating research findings of TAMUS research personnel, or evidence of effective communication or cooperation with TAMUS or researchers from other institutions or entities
   e. Demonstrate ability to obtain grant support from external sources
   f. Presentation of invited papers at industry, professional and/or scientific meetings
   g. Receipt of awards, commendations, or other recognition indicative of excellence in scholarly or service activity

4. Criteria for the Public Service Function
   a. Service to the College, University, and System through committee assignments and leadership roles
   b. Service to professional and scientific societies
   c. Maintenance of strong working relationships with counterparts in the Department
   d. Service to state, regional, and national levels of government
   e. Service to students, student organizations, etc.
Mandatory Periodic Review of Tenured Faculty

In accordance with University Rule 12.06.99.M1, Post-Tenure Review, prior to the sixth anniversary of the date of the awarding of tenure and once every six years thereafter, or in the year following a second successive unsatisfactory annual performance review, each tenured faculty member will submit to the departmental Promotion and Tenure Committee (exclusive of the individual(s) being reviewed) the same documentation submitted to the department head for the annual review for that year. The Committee will review the faculty member’s scholarly productivity, in accordance with the criteria for categories of performance to be assessed in the annual review defined in this document, make a determination of its merit, and report this determination as either satisfactory or unsatisfactory to the department head. The Committee will consider the faculty member’s position description when making the determination of merit.

Three Consecutive Unsatisfactory Reviews

If a faculty member receives three consecutive unsatisfactory reviews, a professional review is initiated. See the university guidelines for the professional review, hearings, appeals and grievances (http://tamus.edu/offices/policy/policies/pdf/32-01-01.pdf); University Rules at http://rules-saps.tamu.edu/; and "Faculty Grievance Procedures Not Concerning Questions of Tenure, Dismissal, or Constitutional Rights at http://rules-saps.tamu.edu/PDFs/12.01.99.M4.pdf)
HORTICULTURAL SCIENCES DEPARTMENTAL STRATEGIC PLAN
UPDATED, April 15, 2008

VISION: We will be widely recognized for excellence in all of our programs and as the best university horticulture department in the United States.

MISSION: The Department of Horticultural Sciences exists to improve the quality of life through teaching, research, and extension programs related to the aesthetic disciplines of horticulture and the production of high quality, healthful fruits and vegetables. This is accomplished by: 1) providing educational opportunities for students in the pursuit of careers in horticulture and related fields; 2) developing and delivering research-based knowledge upon which efficient and profitable horticultural crop production can be built; 3) improving the competitive position of the Texas horticulture industry; 4) increasing the quality, variety, and availability of horticultural products; 5) developing and delivering research-based knowledge related to how horticulture improves our environment and serves as a source of personal enrichment.

GOAL 1: Attract and retain students with high potential who represent diverse backgrounds and experiences
OBJECTIVE: Increase the total number of undergraduate majors in the Department to 200 by early 2010, with at least 30% of the majors being enrolled in the new BA degree program.
BENCHMARK: There are approximately 140 undergraduate majors in the Department as of spring semester 2007.

STRATEGY 1: Implement the newly approved Bachelor of Arts degree program
TIMELINE 1: by late 2007: develop recruiting materials including department CD and distribute via podcasting aimed at student recruitment

STRATEGY 2: Hold annual undergraduate planning retreat to address recruitment and other issues related to our undergraduate program. Follow-up retreat to be held one year later.
TIMELINE 2: First retreat in summer 2008; Follow-up retreat in summer 2009

STRATEGY 3: Add two new undergraduate courses to support BA degree and to broaden our course offerings
TIMELINE 3: Add urban plant ecology course by 2008; add science of foods for health course by 2010

GOAL 2: Sustain healthy ecosystems and conserve our natural resources
OBJECTIVE: Improve documentation of research efforts and their impact (Objective also relates to Research Imperatives of "Improving Public Health and Well-Being" and "Conduct Discovery and Translational Research...")
BENCHMARK: Department has averaged a total of 35-40 refereed publications per year over the past 5 years and has not produced impact statements for individual faculty projects.

STRATEGY 1: Improve documentation of research through publication of refereed journal articles.
TIMELINE 1: Maintain an average total number of refereed publications per year of 45 for FY 08 and FY 09

STRATEGY 2: Require that all faculty members submit an annual impact statement as part of their annual review.
TIMELINE 2: Impact statements arranged into a departmental report by April 15 of each year

GOAL 3: Enhance Natural Resource Conservation and Management
OBJECTIVE: Provide improved mentoring and professional development opportunities for county horticulturists to improve program delivery to clientele
BENCHMARK: Primary interaction with county horticulturists is when problems arise--a more proactive professional development approach is needed. The number of "Agents Only" page downloads from Aggie Horticulture was 6,932 in FY 06.

STRATEGY 1: Associate Department Head for Extension will increase personal interaction with county horticulturists
TIMELINE 1: Semi-annual contact with each county horticulturist will be made by Associate Head via phone or site visits.

STRATEGY 2: Increase involvement and leadership of county horticulturists in annual Extension professional development and planning conference held by Department.
TIMELINE 2: At least two county horticulturists to play a prominent role in planning and implementation of professional development and planning conference to be held May-June each year

STRATEGY 3: Enhance "Agents Only" section of Aggie Horticulture Web site
TIMELINE 3: Annual number of page downloads to increase by 10% each year from 2008 through 2010

GOAL 4: Attract and retain students with high potential who represent diverse backgrounds and experiences
OBJECTIVE: Increase number of graduate students in the Department to 50 by fall 2010
BENCHMARK: For spring semester 2007, the current number of graduate students in the Department is about 40 (including those in interdisciplinary programs)

STRATEGY 1: Consolidate current non-thesis graduate degree programs into a single, new Masters of Horticulture degree program
TIMELINE 1: early 2008--begin faculty discussion at faculty meeting; new degree program approved by 2011

STRATEGY 2: Enhance graduate student recruiting efforts
TIMELINE 2: By Summer 2008--develop web-based recruiting materials for prospective graduate students

STRATEGY 3: Add three new graduate courses to current course offerings
TIMELINE 3: By 2008--add a graduate-level course in urban ecology; By 2009--add one course taught by Floriculture Chair related to horticultural marketing; By 2010--add a course in root biology

GOAL 5: Increase fiscal resources for teaching, research, and extension programs.
BENCHMARK: External grant and contract funding averaged about $1.75 million for the period of FY 02 through FY 05 and the Department has never had a formal development plan.
KEYWORDS: funding, development

STRATEGY 1: Increase efforts to obtain external funding through grants and contracts
TIMELINE 1: Maintain a 5-year rolling annual average of $2.6 million in external grants and contracts obtained by departmental faculty (rolling average is needed to buffer unusually high or low years)

STRATEGY 2: Improve organization and coordination of fund-raising efforts within the Department
TIMELINE 2: by mid 2008--create a development plan for the Department with specific goals and objectives; 2008 and beyond--implement plan

STRATEGY 3: Develop strategies for increasing funding for green industry research and education
TIMELINE 3: by late 2007--complete statewide ornamentals research plan with strategies for
improving funding

STRATEGY 4: Continue to pursue funding opportunities related to viticulture
TIMELINE 4: Maintain funding for Pierce's Disease and SB 1370 projects

GOAL 6: Improve Department-level collaboration and teamwork
BENCHMARK: No specific effort has been focused at improving collaboration and teamwork between departmental faculty members; fragmentation of programs is a weakness

STRATEGY 1: Increase interaction between on- and off-campus research faculty via meetings (retreats, statewide faculty meetings, meetings with TAMU-K faculty) and joint grant proposals
TIMELINE 1: 2008--hold research planning retreat for on- and off-campus research faculty at an off-campus Center; 2009-- submit at least 5 grant proposals jointly authored by on- and off-campus faculty; 2007-2010--have at least three statewide faculty meetings per year

STRATEGY 2: Improve connectivity between Department and VFIC via improved interactions at both the administrative (Department Head and VFIC Director) and faculty levels
TIMELINE 2: 2007-2010--Quarterly meetings to be held between Department Head and VFIC Director to discuss specific ways to improve connectivity; hold at least one special event per year aimed at fostering faculty interaction and continue special theme luncheons

STRATEGY 3: Foster interaction between food crop and ornamentals faculty by providing a financial incentive in the form of a special mini-grant to be used as seed money to address a problem of common interest
TIMELINE 3: 2008-2010: Allocate at least $2,000 per year from indirect cost returns to the unit for joint efforts between food crop and ornamentals faculty

GOAL 7: Improve departmental communication and marketing efforts
BENCHMARK: Other than a bi-monthly newsletter (current distribution is to 200 persons), no specific effort has been made to improve communication and marketing. For FY06, the number of page downloads and unique hosts for Aggie Horticulture were 56 and 5.7 million, respectively.

STRATEGY 1: Continue producing a bi-monthly electronic newsletter for department stakeholders and increase circulation
TIMELINE 1: 2007-2010--bi-monthly newsletter distributed via e-mail announcement; expand mailing list by 10% by 2010

STRATEGY 2: Enhance Aggie Horticulture web site as a vehicle to better tell our story
TIMELINE 2: 2007-2010: increase number of page downloads and unique hosts by 10% per year (contingent upon how the new content management system is implemented)

STRATEGY 3: Produce CD which highlights Departmental programs
TIMELINE 3: mid-2008--finish CD production; late 2008--distribute CD via Department newsletter and podcasting

STRATEGY 4: Increase materials for podcasting
TIMELINE 4: 2008 & 2009--develop at least 10 new podcasts per year OVERSIGHT 4: D.

GOAL 8: Enhance Natural Resource Conservation and Management OBJECTIVE:
Increase efforts to support sustainable horticultural systems
BENCHMARK: We presently have an Earth Kind stewardship program but increased efforts are needed for implementation. Earth Kind electronic newsletter circulation was about 500 in November 2006.
STRATEGY 1: Enhance efforts related to the Earth Kind environmental stewardship program
TIMELINE 1: 2007-2009: hold special Earth Kind session at annual Extension horticulture professional development and program planning conference held by Department

STRATEGY 2: Develop professional training modules for greenhouse workers with emphasis on sustainable production practices and safety
TIMELINE 2: early 2008--complete training modules

STRATEGY 3: Ensure timely communication of Earth Kind principles and practices
TIMELINE 3: 2007: produce monthly Earth Kind electronic newsletter (12 issues per year); 2008 and beyond: produce Earth Kind blog

NEW STRATEGIC GOALS BEGINNING IN 2008

GOAL 9: Attract and retain students with high potential who represent diverse backgrounds and experiences
OBJECTIVE: Explore new opportunities for recruiting undergraduate majors and for increasing weighted student credit hours taught by our Departmental faculty--Increase the total number of undergraduate majors in the Department to 200 by early 2010 and increase the number of weighted student credit hours taught per year to 28,000 by 2011.
BENCHMARK: In spring 2008, we have about 165 undergraduate majors and in FY 07 we taught a total of 25,585 WSCH

STRATEGY 1: Explore the possibility of offering a “sustainable residential landscapes” course that could satisfy the University Core Curriculum for visual/performing arts.
TIMELINE 1: Summer, 2008—discuss at undergraduate retreat; Fall, 2008--further discussion at a faculty meeting; 2009--if course seems feasible, identify instructor(s) and develop course syllabus

STRATEGY 2: Explore the possibility of strengthening our faculty and teaching efforts related to the landscape services sector.
TIMELINE 2: Summer, 2008—discuss at undergraduate retreat; Fall, 2008—further discussion at a faculty meeting; 2009—develop specific strategies for strengthening the curriculum and enhancing faculty capacity in this area

STRATEGY 3: Explore possibility of developing an area of emphasis related to viticulture/enology
TIMELINE 3: Spring/Summer, 2008—hold discussions with relevant faculty and with representatives from the Department of Nutrition and Food Science; Summer, 2008—discuss at undergraduate retreat; 2009— if area of emphasis seems feasible, identify faculty participants and draft requirements; also explore possibility of a “wines and international culture” course for the Humanities Core Curriculum

GOAL 10: Conduct discovery and translational research in the biological/physical/social and behavior sciences
OBJECTIVE: Improve plant biotechnology/molecular biology research capacity within the Department
BENCHMARK: For FY 07, our faculty had 12 refereed journal articles and generated about $288,000 in external grants and contracts related to the general area of plant biotechnology/molecular biology. We have little or no ongoing effort in bioenergy.

STRATEGY 1: Hire at least one new faculty member in the area of plant biotechnology/molecular biology
TIMELINE 1: early 2009—Identify funding sources for position, including salary and start-up; 2010—
develop position description and begin recruiting

STRATEGY 2: Support Dallas Center in hiring a new faculty member in plant biotechnology
TIMELINE 2: Mid 2008—Have at least two departmental faculty members participate in search process; Mid 2009—Make hire

STRATEGY 3: Investigate opportunities for involvement in bioenergy-related research
TIMELINE 3: By mid 2009—one or more faculty members participate in a bio-energy related meeting; 2010—submit at least one grant proposal related to bioenergy research

GOAL 11: Conduct discovery and translational research in the biological/physical/social and behavior sciences
OBJECTIVE: Maintain strength in translational, industry-oriented production research efforts within the Department
BENCHMARK: For FY 07, our faculty had 19 refereed journal articles (0 in viticulture) and generated about $196,000 ($95,000 related to viticulture) in external grants and contracts related to translational, industry-oriented production research. We do not presently have a single, unified approach for dealing with this type of work and disseminating the results/recommendations.

STRATEGY 1: Evaluate opportunities for increasing research efforts in viticulture.
TIMELINE 1: By late 2009—develop a list of specific research priorities in this area; 2010—determine if more research FTE are needed in viticulture; 2011—generate $150,000 in external support, publish at least 3 refereed journal articles and 4 trade-oriented articles related to viticulture

STRATEGY 2: Develop a long-term plan to have a single, unified brand/marketing strategy for recommended plant selections related to the green industry.
TIMELINE 2: mid 2008—appoint a faculty committee to make recommendations regarding a single, unified brand/marketing strategy; early 2009—formulate strategy; 2010 and beyond—implement strategy

STRATEGY 3: Explore the possibility of creating a faculty position related to sustainable/organic small farm niche market production
TIMELINE 3: 2008-2009—explore options for funding the position (e.g. exceptional item, re-direction of existing position); 2010—if position is feasible, begin recruiting