UNIVERSITY OF KENTUCKY

College of Agriculture, Food and Environment
Department of Horticulture

# Department of Horticulture
# Self-Study Report
# 2014-2020


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Dr. Jeff Stringer, Committee Chair and Chair of UK Forestry and Natural Resources
Dr. Desmond Layne, Horticulture Dept. Head, Auburn University
Dr. Harry Klee, Professor, Horticultural Sciences, University of Florida
Dr. Mark Swanson, Associate Professor, UK Department of Health, College of Public Health
Dr. Cindy Finneseth, Executive Director, KY Horticulture Council
Alexis Sheffield, Kentucky Cooperative Extension Service, Boyle County Office
Dr. Krista Jacobsen, Associate Professor, UK Department of Horticulture
Steve Diver, Farm Superintendent, UK Horticulture Research Farm
Layne Ellen Harris, Graduate Student, UK Departments of Horticulture / Plant &Soil Sciences

**Date Submitted:**
March 15, 2020

# Table of Contents

.

DEPARTMENTAL RESEARCH PROGRAM



DEPARTMENTAL EXTENSION PROGRAM

# List of Tables and Figures

# Table of Appendices

# Executive Summary

## Brief Overview of the Department of Horticulture

The Department of Horticulture (HRT) is one of 14 academic units in the college of Agriculture, Food and Environment (CAFE). The department addresses major issues faced by the horticulture industry – production efficiency, sustainability, food safety and quality - through our programs in research, extension and teaching. Departmental research broadly focuses on utilizing applied and basic approaches to increase the sustainability of our food systems and their positive impact on human health and well-being. Faculty advising graduate students are part of the Integrated Plant and Soil Sciences (IPSS) graduate program. Undergraduate education is through our recently proposed Horticultural Science program and through a certificate in Distillation, Wine, and Brewing Studies, which is currently housed in our department. Departmental extension faculty and staff work with a wide array or area stakeholders to provide science-based information that positively impacts the sustainability of horticulture production in Kentucky. Two unique features of our department include the management of the Horticulture Research Farm and The Arboretum State Botanic Garden of Kentucky. In addition to our on-campus facilities, departmental faculty and staff are located at CAFE research and education units in the western and eastern parts of our state.

## Self-Study Process

Dr. Lisa Collins, Ms. Tricia Coakley and Dr. Brian Lee from the Office of Faculty Resources, Planning and Assessment met with Dr. Mark Williams, Chair of Horticulture, to describe the review process, identify committee members to serve on the review committee, and provide a recently developed template for completing the self-study. The self-study was compiled from various department, college, and university reports. Faculty were chosen by the Chair based on their emphasis in each of the three land-grant mission areas (i.e., Directors of Undergraduate Study, Extension Coordinator, etc.) to develop and contribute to sections of the report. Additional input was solicited from faculty, staff and students as appropriate.

## Review Committee Members and Affiliations

Dr. Jeff Stringer, Review Committee Chair and Chair of UK Forestry and Natural Resources
Dr. Desmond Layne, Horticulture Dept. Head, Auburn University
Dr. Harry Klee, Professor, Horticultural Sciences, University of Florida
Dr. Mark Swanson, Associate Professor, UK Department of Health, College of Public Health
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Layne Ellen Harris, Graduate Student, UK Departments of Horticulture / Plant &Soil Sciences

## Overview of Progress since the Previous Program Review

The 2007–2013 Program Review included the following recommendations that were addressed annually, and the collective actions for the period under review are summarized below. The annual Review Reports from 2014–2019 can be found at http://administration.ca.uky.edu/ipreports. The implementation plan from the 2007–2013 Program Review can be found in **Appendix A**.

**Recommendation – Communication seems to be difficult from a number of standpoints. People feel out of the loop, and non-faculty (staff, students, etc.) want to be part of the conversation, or at least informed. Listservs, regular faculty meetings, social events, and graduate student staff liaisons at faculty meetings could all be helpful. There is a level of camaraderie that exists on the Horticulture Research Farm (HRF) that appears lacking elsewhere in the department. In addition to internal communications, some focus on external marketing and a stronger web presence for the department and sustainable agriculture program and farm is important.**

The previous Chair, who served in that role from 2009–2018, initiated group biannual meetings with all categories of staff, including farm and CSA staff, administrative and technical staff, and Arboretum staff. These meeting were poorly attended, and the majority of staff did not want to continue these meetings. The Chair returned to the policy of one-on-one meetings as necessary with staff and students.

**Recommendation – The department needs to develop a long-term vision and strategic plan that is more specific to its needs and goals. This should be done with meaningful input from staff and students. The focus on sustainability seems broadly accepted, though it was also clear that more definition needs to be put around that concept so the department has some consensus on positions, prioritizing resource needs, and coordinating research and extension effort.**

The department is currently in the process of developing a strategy to identify a critical need, goals and staffing guidelines. This is particularly important given the impending faculty retirements over the next 2–3 years. Analysis of the departmental focus on sustainability reveals broad support across the entire department and should be better articulated in our online materials.

**Recommendation – The department needs to develop a cohesive graduate education experience. Students expressed a need for informational seminars and the desire to know more about what other faculty are doing and how the work of their labs relate to the work of the department as a whole. Specific recommendations include the following:**

- **Develop formal teaching or extension experiences, depending on students' interests, as an integral part of the education of graduate students in the Horticulture Department.**
- **Develop a competitive pool of funding for graduate students to attend scientific meetings. This funding would benefit students and allow the department to have a greater presence at conferences.**
- **Work to create more professional and social interaction through organized departmental activities for faculty and students as well as encouraging students to organize as a group.**
- **Develop a seminar or short classes that focus on grant writing activities, cross-training on equipment and techniques, and other subjects that would assist graduate students in their career preparation.**

Specific funds for graduate student development were identified and are being utilized.
Graduate students have responded positively to extra professional development opportunities to learn about professional responsibilities and funding opportunities. This has been a positive move forward for the department in terms of graduate education and will be continued.

**Recommendation - Leverage existing tobacco settlement funds towards identifying and securing sustainable long-term funding for essential extension related programs.**
**Assessment method: The number of programs and amount of funding dependent on tobacco settlement funds will be monitored.**

The department continues to evaluate all options to transition programs dependent on tobacco settlement funds from the KY Agriculture Development Board into sustainable funding sources. A new initiative to sell wine from the enology program will offset some of the program's dependence on tobacco settlement funds. This program has become active and shows great promise for reducing our dependency on these funds. Additionally, a greenhouse rental program for local beginning growers has been established to augment reduced funding at our research farm.

**Recommendation – Identify under-utilized office and laboratory space in the Plant Science building and lobby administration to move a significant portion (if not all) of the Horticulture Department.**

The number of Horticulture faculty, graduate students, post-docs, and staff housed in the Plant Science Building has been increased as has laboratory and office space.

**Recommendation – Find ways to provide stable recurring funding for extension associates and identify a funding source for the Crop Diversification & Biofuel Research & Education Center.**

The Center for Crop Diversification is now a multi-state regional project with hard funding. We have been successful in creating hard funding and reducing our dependency on tobacco settlement funds by ~$0.25 million. We will continue to exploit all possible means to reduce our dependency on tobacco settlement funds and create hard funding for extension associates.

**Recommendation – Continue efforts to transform the Horticulture Research Farm (HRF) into a nationally recognized center for sustainable horticulture.**

A new farm superintendent was hired in 2014. Substantial financial and personnel resources have been invested to further develop the research, extension, and teaching capacity at the farm. Continuous improvements have been made in the infrastructure, equipment, and facilities at the farm. The number of local, regional and national events, conferences, and trainings has substantially increased. For example, two to six international students per year have lived at the in the international student guesthouse and participated in the farming apprenticeship program.

**Recommendation – Identify mechanisms to fill existing vacant faculty positions and, moreover, ways to increase the number of faculty lines in the department.**

Two new faculty positions have been filled since the last program review. An Extension Vegetable Specialist was hired after the position was vacated by the departure of a former faculty member. CAFE

administration then allowed the department to hire an additional faculty member as a mortgage position due to an impending faculty retirement. Our faculty determined that this second position would focus on plant/microbiome research.

**Recommendation – Identify and implement a solution to the declining enrollment in the Horticulture and Plant Science undergraduate program.**

The multidisciplinary Horticulture, Plant and Soil Science (HPLS) undergraduate program was ended in 2019, and the department will be launching its own Horticulture Science (HRT) program in fall 2020. The focus will be to develop a program capable of attracting students at a sustained enrollment and graduation level while successfully placing students in horticulture-related jobs or advanced study.

**Recommendation – Identify mechanisms to reward outstanding faculty and staff.**

The previous Chair along with faculty support successfully nominated several departmental colleagues for awards since the last review. Emphasis was placed on recognizing and nominating outstanding accomplishments.

## Analysis of Strengths, Challenges and Recommendations for Improvement

The development of the self-study for this review necessitated a holistic assessment of the progression of our department over the last six years. This retrospective evaluation revealed several departmental strengths, including:

- A dedicated faculty and staff that are committed to excellence in our mission areas of teaching, research, and extension.
- Commitment to undergraduate and graduate student success by teaching faculty and staff and strong collaboration with several interdisciplinary undergraduate programs and certificates.
- Sustained extramural support for research across a broad range of projects.
- Consistent innovation in all three mission areas that create new and highly visible programs within our university.
- Diverse extension programs and outreach activities that are positively impacting the sustainability of horticulture in Kentucky.
- Strong relationships with the KY Department of Agriculture and the horticulture industry through the KY Horticulture Council and several grower organizations.
- A well-managed research farm that facilitates a wide range of departmental-directed and interdisciplinary projects.
- Excellent opportunity for community engagement and education through the UK Arboretum and Community Supported Agriculture (CSA) program and the Kentucky Extension Master Gardener Program.

The self-study process also identified the following challenges for the department:

- Budgetary constraints continue to challenge our ability to maintain the Horticulture Research Farm, departmental infrastructure, and equipment.

- There is a historically based unsustainable dependency on tobacco settlement funding through the Kentucky Agriculture Development Board for essential Extension related programs.
- Impending faculty retirements must be filled to ensure continued departmental continuity and success.
- Maintaining a cohesive sense of departmental community is complicated by the dispersed nature of our departmental employees.
- Increased research efforts and success have resulted in a limitation on office space for graduate students, Postdocs and Visiting Scholars.
- Growth in the horticulture industry has created increased demand for travel by our Extension faculty, which negatively impacts other programmatic areas such as applied research, scholarship and teaching. This is particularly important for our non-tenured faculty and is unsustainable.
- The opportunity to develop a new undergraduate degree program will require increased recruitment and faculty commitment to teaching.
- The departmental website is out of date and needs substantial modification.

To address these challenges the following opportunities were identified:

- Increase the departmental budget, particularly regarding operating expenses for the Horticulture Research Farm and departmental operating expenses.
- Leverage existing tobacco settlement funds towards identifying and securing sustainable long-term funding for departmental Extension Associates.
- Develop a departmental strategic plan correlated to the new college plan that will be developed in 2021.
- Conduct biannual staff meetings to increase transparency and provide opportunities for staff involvement in departmental decision-making.
- Develop recruitment strategies for the new undergraduate degree program and a comprehensive plan for programmatic development of teaching faculty based on filling faculty retirements..
- Upgrade the departmental website.
- Work with CAFE Extension leadership to develop strategies to support the use of electronic media for extension programming in an effort to reduce travel commitments. This is particularly relevant for our untenured faculty and will need to be supported by county agents.
- Create a department list of past funding sources (last 5-10 years). This list will help current and future faculty and staff identify potential sources of research funds. Additionally, a departmental grant opportunity search should be generated using grants.gov.
- Annual submission of a substantial and signature department grant central to our core mission. A large multidisciplinary grant should be prepared by the department faculty/staff for submission to USDA/NSF/NIH or other large nationally-competitive calls. The object of research and funding call will be chosen during a faculty meeting the year before submission from a pool of project summaries suggested by department members.
- Identify the means to provide technical staff support positions (or similar support; e.g. graduate student stipends) to all research programs.

# Introduction and Departmental Overview

## Introduction

The Department of Horticulture (HRT) is one of 14 academic units in the college of Agriculture, Food and Environment (CAFE). The department addresses major issues faced by the horticulture industry – production efficiency, sustainability, food safety and quality - through our programs in research, Extension, and teaching.

Departmental undergraduate education focuses on two distinct programs. For over 25 years, HRT was involved in a multidisciplinary undergraduate degree program, Horticulture, Plant and Soil Science (HPLS). The ending of that program in 2019 created the opportunity to develop a new departmental Bachelor of Science program, Horticultural Science (HRT), which will officially start in Fall 2020. The department also houses the recently created Distillation, Wine and Brewing Studies (DWBS) undergraduate certificate program. In addition to these programs, departmental faculty contributes leadership and instruction to two multidisciplinary undergraduate degree programs: Sustainable Agriculture and Community Food Systems (SAG), and Agriculture and Medical Biotechnology (ABT).

Graduate students advised by our faculty are enrolled in the Integrated Plant and Soil Sciences (IPSS) graduate program, which began in Spring 2012. This interdepartmental program between the departments of Horticulture, Plant and Soil Science, and Forestry offers Doctorate (Ph.D.) and Masters (M.S.) degrees. IPSS provides a unique opportunity to cultivate and exploit the benefits of an interdisciplinary approach to graduate education and research. A strength of the program is in its flexibility regarding required coursework, which allows the curriculum to be tailored to individual student needs. This creates a dynamic learning environment that is responsive to developing scientific trends in agriculture. In addition to graduate training through this program, our faculty contribute their expertise as graduate student committee members in numerous programs in other departments and colleges at our university.

Departmental research broadly focuses on utilizing applied and basic research to increase the sustainability of our food systems and their positive impact on human health and well-being. Research integrates our teaching and extension programming and covers areas such as cell wall synthesis, enzymology, natural products, environmental genomics, plant microbiome interactions, conventional and organic production practices, carbon and nitrogen cycling, breeding for pest resistance, and seed and fruit biology.

Departmental Extension faculty and staff work with a wide array of area stakeholders to provide science-based information that positively impacts the sustainability of horticulture production in Kentucky and benefits horticultural engagement by citizens. Educational training, learning resources, and consultations are provided by Extension Specialists, Extension Associates, and other personnel in all areas of horticulture production. Our Extension faculty conduct applied research at our research farm and on the farms of grower collaborators and participate in interdisciplinary research projects with other departments. Collectively these efforts form the foundation for our outreach activities and allow us to address the changing needs of each component of the horticulture industry in our state. A unique and significant component of our extension programming occurs through the Center for Crop Diversification (https://www.uky.edu/ccd/) which was founded in our department through tobacco

settlement funds, and is focused on specialty crop production, processing and food safety. The Kentucky Extension Master Gardener Program is active in many counties of the state and assists county extension agents in disseminating research-based horticulture information to consumers.

The department also maintains several additional units and areas that support our land-grant mission of research, outreach and teaching. These include: the 100-acre UK Horticulture Research Farm, located in south Lexington; research and extension programs based at the Research and Education Unit in Princeton (western KY) and at the Robinson Center for Appalachian Resource Sustainability in eastern KY; and The Arboretum State Botanical Garden of Kentucky (http://arboretum.ca.uky.edu/home). The Arboretum recently underwent a program review that culminated in the development of an Action Plan Committee Report that can be found in **Appendix B**. The Arboretum will therefore only be included in this Self-Study where appropriate.

## Departmental Mission and Vision

The mission of the Department of Horticulture is to provide research, educational, and instructional capabilities that demonstrate economically viable and sustainable production practices for Horticultural crops that can improve human health, nutrition, and well-being, while preserving the integrity of natural resources.

It is the vision of the Department of Horticulture to become nationally recognized through our instructional, research, and extension programs in the area of sustainable production practices for Horticultural crops and biofuels research.

## Department Faculty and Staff

There are currently 16 full-time faculty in the department (**Table 1**). The distribution is as follows: 10 Professors, 3 Associate Professors, 2 Assistant Professors, and 1 Lecturer. Three full-time faculty are women. Eleven faculty are located in the Agriculture Science Building North, four are in the Plant Science Building, and one is at the Research and Education Unit in Princeton, Kentucky. One faculty member is in the second year of a two-year post-retirement appointment and one is the Associate Dean for Research for CAFE. Faculty CVs can be found at https://www.uky.edu/hort/People.

**Table 1. Faculty Listing**

| Name | Rank | Specialty |
|---|---|---|
| Archbold, Douglas | Professor | Post-harvest physiology |
| DeBolt, Seth | Professor | Natural products, cell wall physiology |
| Downie, Bruce A. | Associate Professor | Seed biology |
| Dunwell, Winston | Extension Professor | Nursery production |
| Durham, Richard | Extension Professor | Home horticulture |
| Fountain, William | Extension Professor | Arboriculture |
| Geneve, Robert | Professor | Propagation, seed biology |
| Houtz, Robert | Professor and Associate Dean | Plant biochemistry |
| Ingram, Dewayne | Extension Professor (post-retirement) | Nursery production |
| Jacobsen, Krista | Associate Professor | Agroecology |
| Lopez, Carlos | Assistant Professor | Environmental genomics |
| Rudolph, Rachel | Assistant Extension Professor | Vegetable production |
| Scott, Ruth | Lecturer | Floral design |
| Snyder, John | Associate Professor | Breeding, physiology |
| Strang, John | Extension Professor | Fruit and nut production |
| Williams, Mark | Professor and Chair | Organic vegetable production |

**Table 2** shows the aggregate DOE across the three Land-Grant mission areas for the period under review, measured in Full Time Equivalents (FTEs). Recent increases in administrative FTE are due to three faculty being appointed as Directors to college and university level programs and institutes. In FY 2019 faculty DOE is distributed as follows: 40% research, 32% extension, 20% teaching, and 8% administration.

| Table 2. Aggregate Distribution of Effort (DOE) for Full-time Faculty by Year | | | | | |
|---|---|---|---|---|---|
| Year | FTE Instruction | FTE Research | FTE Service | FTE Admin. | Total FTE I+R+S+A |
| 2014 | 2.79 | 6.27 | 5.53 | 0.40 | 14.99 |
| 2015 | 2.79 | 5.79 | 5.97 | 0.45 | 15.00 |
| 2016 | 3.63 | 5.42 | 5.50 | 0.45 | 15.00 |
| 2017 | 3.04 | 5.18 | 4.53 | 0.85 | 13.60 |
| 2018 | 2.85 | 5.56 | 5.69 | 1.90 | 16.00 |
| 2019 | 2.85 | 5.77 | 4.46 | 1.93 | 15.01 |

**Table 3** shows a snapshot of faculty distribution by age. Notably, 56% of faculty are 60 years or older. It is expected that there will be a significant turnover in faculty in the next 2-3 years, which creates a tremendous opportunity for departmental development.

| Table 3. Faculty Distribution by Age | | |
|---|---|---|
| **Age** | **Faculty** | **Percent** |
| 30-39 | 1 | 6% |
| 40-49 | 3 | 19% |
| 50-59 | 3 | 19% |
| 60-65 | 4 | 25% |
| >65 | 5 | 31% |

**Table 4** shows the current status of adjunct faculty in our department. Adjunct faculty members are appointed to provide special knowledge or skills for collaborative research projects and graduate student committees.

| Table 4. Adjunct Faculty Listing | | |
|---|---|---|
| Name | Rank | Home Institution |
| Antonious, George | Professor | Kentucky State University |
| Lucas, Shawn | Assistant Professor | Kentucky State University |
| Pomper, Kirk | Associate Professor | Kentucky State University |
| Whittinghill, Leigh | Assistant Professor | Kentucky State University |

The department currently has 39 professional and support staff employees (**Table 5**). Fifteen staff are located in the Agriculture Science Building North, five in the Plant Science Building, six at the Arboretum, eight at the Horticulture Research Farm (HRF), two at the Robinson Center for Appalachian Resource Sustainability (RCARS) (Jackson, Kentucky), and three are at the UK Research and Education Center in Princeton, Kentucky. Staff responsibilities include 15 Research Analysts/Technicians/Specialists, four Business Office staff, one shared (w/Landscape Architecture and Veterinary Science) IT Support Specialist , one Arboretum Manager, one Research Manager, 12

Extension Associates/Specialists, one Education Program Coordinator, one Special Events Coordinator, and three Horticulturists.

| Table 5. Staff Listing | | |
|---|---|---|
| Name | Title | Supervisor |
| Bailey, Dawn | Program Coordinator I | Molly Davis |
| Baston, Dayna | Administrative Support Associate I | Molly Davis |
| Becker, Daniel | Ag Extension Associate | Winston Dunwell |
| Berberich, Stephen | Ag Extension Associate Senior | Dewayne Ingram |
| Cassady, Christy | Ag Extension Specialist | Mark Williams |
| Clouser, Grant | Research Analyst | Steve Diver |
| Compton, Pamela | Admin Support Associate I | Dale Shuler |
| Dahl, Jesse | Horticulturist Senior | Molly Davis |
| Davis, Molly | Arboretum Director | Mark Williams |
| Dirk, Lynnette | Research Analyst | Mark Williams |
| Diver, Steve | Farm Superintendent | Mark Williams |
| Durbin, Kristi | Horticulturist Senior | Mark Williams |
| Dutton, Shari | Horticulturist | Richard Durham |
| Evans, Annette | Special Events Coordinator | Molly Davis |
| Ellingson, Emily | Ag Extension Associate Senior | Molly Davis |
| Jones, Shelby | Computer Support Specialist II | Mark Williams |
| Kester, Sharon | Research Analyst | Robert Geneve |
| Kight, Joshua | Ag Extension Associate | Dewayne Ingram |
| Knight, Joshua | Ag Extension Associate Senior | Dewayne Ingram |
| Lowry, David | Laboratory Technician Senior | Steve Diver |
| Lynch, Sean | Ag Extension Associate | Patsy Wilson |
| Magnani, Roberta | Ag Research Specialist | Robert Houtz |
| Neace, David | Research Farm Tech II | Shawn Wright |
| Nosarzewski, Marta | Research Analyst | Douglas Archbold |
| Rowell, Brent A. | Ag Extension Specialist Principle | Mark Williams |
| Savage, Nancy | Research Analyst | Jeffrey Wheeler |
| Shrestha, Debendra | Research Analyst | Krista Jacobsen |
| Shuler, Dale | Administrative Staff Officer II | Mark Williams |
| Smigell, Christopher | Ag Extension Associate | Dewayne Ingram |
| Stephens, Denise | Account Clerk III | Dale Shuler |
| Stork, Jozsef | Research Analyst | Seth DeBolt |
| Tesfamicael, Kiflu | Research Analyst | Carlos Lopez |
| Travis, Virginia | Laboratory Technician Senior | Winston Dunwell |
| Wilson, Neil | Research Analyst Principal | Mark Williams |
| Wilson, Patsy | Ag Extension Specialist | Mark Williams |
| Wheeler, Jeffrey | Ag Extension Specialist Senior | Mark Williams |
| Wolfe, Dwight | Ag Research Specialist | Winston Dunwell |
| Wright, Shawn | Ag Extension Specialist Senior | Mark Williams |
| Yates, Benjamin | Research Farm Tech III | Rachel Rudolph |

## Departmental Organization

The department is organized and governed by the Department of Horticulture Rules of Procedure (**Appendix C**), which was substantially modified and approved on 30 April 2019 to be consistent with the Governing Regulations and the Administrative Regulations of the University of Kentucky, the Rules of the University Senate, and the Rules of Procedure of the CAFE.

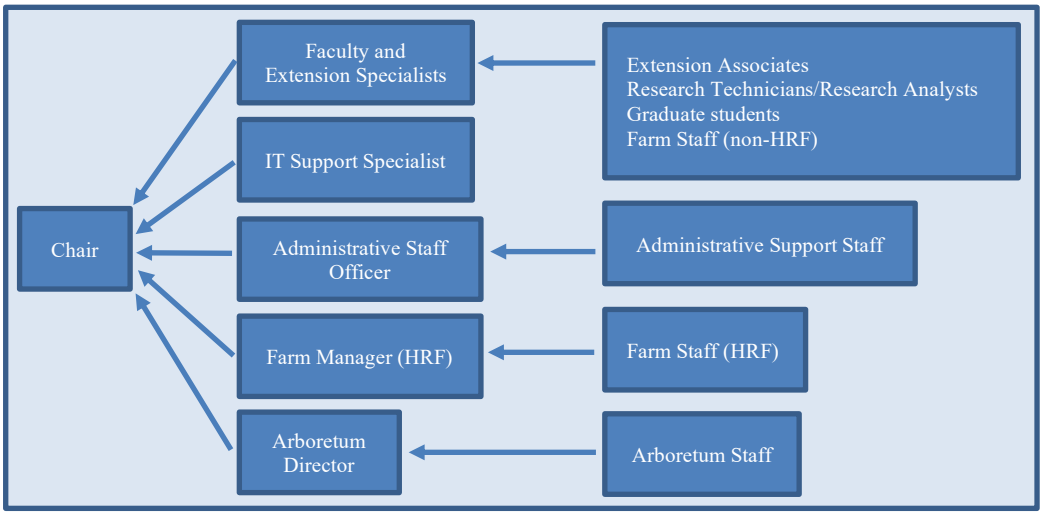
Department organization includes the following: Dr. Mark Williams, Chair of the Department of Horticulture, reports to Dean M. Nancy Cox. Faculty and Extension Associates, Administrative and IT support staff, the Research Farm Manager, and the Arboretum Manager all report to the Chair. The faculty include the Director of Undergraduate Studies for HRT and DWBS, and an Extension Program Coordinator. Currently two departmental faculty serve on the IPSS Steering Committee. The Department includes three administrative support staff in the Agriculture Science Building and one at the Arboretum. Standing departmental committees appointed by the Chair include: Departmental Advisory Committee, Undergraduate Education and Scholarship Committee, Graduate Studies Committee, Horticulture Research Farm Committee, and an On-Campus Greenhouse Committee. Members of standing committees serve two-year terms and can be reappointed by the Chair. Faculty meetings occur monthly as needed throughout the year. Minutes of all meetings are taken by a departmental staff representative, submitted to the faculty, and filed in the departmental office.

The department relies heavily on college resources for procedural guidance, business management, student services, legal guidance, pre-award grant proposal assistance, and overall leadership. Additionally, the department utilizes university support through Human Resources, the Office of Sponsored Projects Administration, and Accounts Payable. Recent hires and development in the college Office of Philanthropy have increased opportunities for fund raising, particularly regarding the Distilled Spirits Institute (see Notable Research Accomplishments in the Research section) and The Arboretum.

Faculty personnel actions such as appointments, performance evaluations, tenure, and promotions are heavily regulated by University procedures, with multiple checkpoints to ensure adherence to policies. Guidelines for all procedural aspects of college and departmental administration, faculty governance, including the department's Statement on Evidences of Activity (**Appendix D**), and assessment are available online through the CAFE Office of Faculty Resources, Planning and Assessment (https://administration.ca.uky.edu/ofrpa).

A departmental organizational diagram can be found in **Figure 1**.

**Figure 1. Horticulture Organization**



## Facilities and Equipment

### *On campus facilities*

Departmental research space and personnel is divided between the Agriculture Science North and Plant Science buildings. Facilities include a mixture of regular labs, storage space, and smaller areas designated for specific usage. Our faculty also utilize shared space with other departments for freezers, incubators, growth chambers, etc. In the Plant Science Building, the department has five labs that are used for research in plant biochemistry, seed biology, plant natural product chemistry, cellulose biochemistry and biofuel research, and environmental genomics. In Agriculture Science North, the department has four labs used for research in crop physiology and biochemistry, plant breeding, agroecology, and nematology. The department also manages and conducts research in six greenhouses and an associated headhouse located adjacent to Agriculture Science North. In addition to typical climate control, some of these greenhouses have artificial lighting and automated watering cababilities

### *Off campus facilities*

One of the unique features of the department is that it manages its own research unit called the Horticulture Research Farm (HRF). The farm was purchased in the mid-1950s and is located in the southern part of Lexington, approximately 6 miles from campus. The farm occupies approximately 100 acres and is used for a wide variety of research and extension activities, including conventional vegetable production, controlled environment crop production, fruit production, variety trials for disease and pest-resistance, and ornamental production. The farm also houses the viticulture and enology program with approximately four acres of wine grapes selected for this geographic region in production, a high-density hard cider apple orchard, and an enology facility, which is adjacent to a general use field lab. In addition to an array of equipment and facilities associated with field research, there are multiple levels of controlled environment structures, from stationary and movable high-tunnels to replicated, fully climate-controlled greenhouses.

The farm also includes the 30-acre UK Organic Farming Unit (OFU) which is used for research and extension focused on sustainable organic horticulture production. There is a 10 kW solar array on the OFU which offsets energy usage on that section of the farm. Approximately half of the space on the OFU is used as a demonstration and teaching farm, with the crops sold to the UK community of faculty, students, and staff through a Community Supported Agriculture (CSA) program (https://ukcsa.wordpress.com). The CSA project provides an opportunity for students enrolled in *Apprenticeship in Sustainable Agriculture* (SAG 397) to gain hands-on experience while learning the scientific basis for sustainable farming practices. This is a foundational class in the Sustainable Agriculture and Community Food Systems (SAG) undergraduate program. The CSA program and SAG 397 are also a significant attractant for international students who live on the farm in our International Student Guest House. The HRF is staffed by a full-time farm manager, and two farm technicians.

The department also conducts field research at two other experiment station centers, the Research and Education Center at Princeton (http://wkrec.ca.uky.edu) and the Robinson Center for Appalachian Resource Sustainability (RCARS, http://rcars.ca.uky.edu).

Through the combination of college and department funds, we have been able to provide generous start-up packages for new faculty that have helped them obtain the necessary equipment to complete their research and/or outreach activities. Additionally, faculty include budgeting in their competitive grant proposals for equipment.

One of the more difficult equipment concerns is farm equipment, which is rarely fundable through competitive grants, but of absolute necessity for farm operations. As much of our farm equipment continues to age, the cumulative cost of repair is becoming unattainable. College administration has helped on several occasions with the purchase of new equipment (and infrastructure improvements) but as operations expand at the HRF we will have to identify additional funding sources.

## Departmental Budget

The department is funded through CAFE budget funds, external grant funds, revenue from income generated at our research farm, and unrestricted gifts. The main sources of funding are through state allocations to our college, which make up the majority of our funding, and federal (US Department of Agriculture) funds through the Agricultural Experiment Station. Combined, this funding supports departmental research, teaching and Extension. In FY 2019, total federal and state funds allocated to the department is $3,060,861 **(Table 6).** Importantly, 96.7% of these funds are allocated to salary, which leaves 3.3% or $102,361 for operating expenses. Considering the constant financial demands of managing a research farm and sections of two other research units, this level of operating expense creates an on-going challenge and necessitates the development of supplementary funding sources.

**Table 6. Departmental Budget**

| Fiscal year | State | Federal | Total ($) | Percent State/federal |
|---|---|---|---|---|
| 2014-2015 | $1,720,729 | $1,033,044 | $2,753,773 | 62%/38% |
| 2015-2016 | $1,781,135 | $999,501 | $2.781,636 | 64%/36% |
| 2016-2017 | $1,884,506 | $1,029,858 | $2,914,364 | 65%/35% |
| 2017-2018 | $2,003,808 | $1,075,736 | $3,079,544 | 65%/35% |
| 2018-2019 | $2,104,597 | $937,584 | $3,042,181 | 69%/31% |
| 2019-2020 | $2,173,483 | $887,378 | $3,060,861 | 71%/29% |

The department also is the recipient of significant sources of outside funding. Competitive research-based funding is identified below in the section on Research section. The department has also been the recipient of significant funds from the Kentucky Agricultural Development Board (https://agpolicy.ky.gov/board/Pages/default.aspx), which was created by the 2000 Kentucky General Assembly to distribute 50% of state monies received from the Master Settlement Agreement for the general purpose of agricultural development in the Commonwealth. The two programs within the department that have been funded through this program have been the cross-commodity, on-farm demonstration and consultation program funded through the Kentucky Horticulture Council (KHC, https://kyhortcouncil.org) under the leadership of Dr. Dewayne Ingram, and the viticulture and enology program through the Kentucky Grape and Wine Council (http://www.kentuckywine.com) under the leadership of Ms. Patsy Wilson. Together these awards fund six extension associates, two research technicians, and one senior extension specialist. The most recent of these awards was $361,901 to the on-farm demonstration and consultation program **(Table 7),** and $190,090 to the viticulture and enology program. Together these awards fund four extension associates, one Senior Extension Specialist, and one Research Analyst. A critically important aspect of this funding is that it has been cut by 5% each year for the last four years, and it is expected that these funding cuts will continue in the future. These reductions create a substantial challenge in our ability to meet the ever-increasing needs of the horticultural industries in the state.

**Table 7.** Funding distribution for the On-farm Demonstration and Consultation Program (Horticulture Council Grant) since 2014. *On-farm tech support* includes Extension Associate salary and benefits and accounts for 94% of the allocation. *Production system development* is for the research farm support, including salary for one temporary employee at the Horticulture Research Farm, which account for 60% of that allocation.

| Table 7. Horticulture Council Grant Funding Distribution | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Program Area** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** |
| **Production System Development** | $170,000 | $145,500 | $145,000 | $138,000 | $125,625 | $122,944 | $95,079 |
| **On-Farm Technical Support** | $320,000 | $345,500 | $341,000 | $321,800 | $286,000 | $266,822 | $266,822 |
| | | | | | | | |
| **Total to Department** | $490,000 | $491,000 | $486,000 | $459,800 | $411,625 | $389,766 | $361,901 |

## Diversity, Inclusivity, and Civility

Our department is committed to diversity, inclusion and civility as a vital characteristic of our work environment. We support UK's conviction that it must work to enhance the diversity and inclusivity of our community through recruitment and retention of an increasingly diverse population of faculty, administrators, staff, and students. We recognize and are committed to the importance of diversity in our personnel, and in accordance with UK guidelines, all faculty and staff searches make an effort to reach individuals from underrepresented groups. Currently, our department only has three female faculty members and this lack of diversity needs to prominently factor into future faculty hires. Of our full-time staff, 44% are female.

Inclusivity and civility need to be more emphasized and potential opportunities exist through departmental staff meetings and more intentionally inclusive departmental decision-making where appropriate. One indication that we are making progress in some areas of inclusivity can be found in the 2019 UK @ Work Survey (**Appendix E**), which allows staff and faculty the opportunity to evaluate several aspects of our department and university including, leadership, engagement, communication and working relationships. Several key categories related to inclusion show substantial favorable increases since the last survey in 2017. These include "My Department Chair/Director/Dean/Supervisor treats me with respect" (23% increase among respondents), "I have confidence in the decisions made by my college/unit/area leadership" (23% increase), and "There is sufficient contact between college/unit/area leadership and faculty/staff at UK" (14% increase).

Stakeholder engagement includes interactions with primarily commercial growers, county extension agents, staff, and undergraduate/graduate students. Commercial growers often communicate their satisfaction/dissatisfaction through local county extension agents, and the Kentucky Cooperative Extension Service routinely surveys county agents for feedback on extension specialist and associates in the Department of Horticulture. Staff are represented on some topically appropriate departmental committees. Although the department does not have a formal stakeholder advisory board, the KY Horticulture Council (see previous section), which is made up of representatives from all of the major horticulture industries in our state, serves in this capacity. Feedback from this group helps shape research and extension programming decisions, particularly those associated with the Agriculture Development Board funding through the KY Horticulture Council.

# Departmental Instruction Program

## Horticulture Undergraduate Program

For the period of this review, Horticulture shared an undergraduate degree program with the Department of Plant and Soils Science, called Horticulture, Plant and Soil Science (HPLS). This program was developed over 25 years ago when two departmental programs were merged due to low student enrollment. The HPLS program involved four options: Horticulture Enterprise Management; Turfgrass Science; Crops and Livestock; and Crops, Soil and Horticulture Science. Horticulture faculty advise students in the first and last option, and the Horticulture Enterprise Management option has historically enrolled the most majors. While data for this review will focus on HPLS, some context is in order regarding several developments over the past two years that will have significant impact on the future horticulture undergraduate program. In 2018, following recommendations from their department's periodic review, the Department of Plant and Soil Sciences announced that they would no longer participate in the shared HPLS program. This effectively reduced the options of the major to Horticulture Enterprise Management, as well as the Horticulture portion of the Crops, Soil and Horticulture Science option. Since early 2019, the Department of Horticulture has worked toward transferring ownership of the HPLS program to Horticulture from Plant and Soil Science, renaming the major as Horticultural Science (HRT), and revising the options to Horticulture and Plant Sciences and Horticulture Plant Production and Management. These actions are pending approval by the University Senate and University Board of Trustees and we will address our vision for this change at the end of this section.

### *Student and Employer Demand*

Horticulture undergraduate total enrollment has dominated the HPLS program but has varied from year to year with an average of 29 students per year (**Table 8**). Most students (averaging 67%) in the HPLS program are in the horticulture options. While the share of students enrolled in horticulture-related options is high relative to HPLS majors, the vague nature of the program name may fail to draw the attention of and attract students interested in horticulture to the major. Analysis using Burning Glass®, which is a market assessment tool that provides data such as number of job postings posted related to a field of study; number of graduates in that field; the specific skills employers look for among those jobs; and what skills correspond to increased starting salaries. A Burning Glass assessment prepared for this review revealed that 62 US colleges and universities conferred 922 horticulture or related bachelor's degrees in 2019 with a mean of 14 degrees awarded per institution and a median of 10 degrees conferred per institution (**see Appendix F for more information**). Clearly University of Kentucky Horticulture is below average in student numbers, but recruitment may be hindered by having horticulture imbedded in a broad major. The Department of Horticulture looks forward to the opportunity to advertise the new Horticultural Science major. Additionally, faculty are excited that Affordable Schools (https://affordableschools.net/bachelors-applied-horticulture/) ranked UK's HPLS program as 13th among their 25 Best Affordable Applied Horticulture (Bachelor's) Degree Programs 2020. We see the affordability and visibility of new Horticultural Science degree as opportunities.

**Table 8. Student Numbers and Distribution in HPLS**

| Year | Total students HPLS | Students advised by Horticulture faculty (% of total) | Conferred BS degrees in Horticulture options |
|---|---|---|---|
| 2014 | 46 | 23 (50%) | 6 |
| 2015 | 59 | 36 (61%) | 3 |

| | | | |
|---|---|---|---|
| 2016 | 44 | 29 (66%) | 5 |
| 2017 | 45 | 31 (69%) | 8 |
| 2018 | 31 | 23 (74%) | 7 |
| 2019 | 37 | 31 (84%) | 9 |
| Average | 43 | 29 (67%) | 6.3 (median = 6.5) |

Demand for graduates in horticulture is strong. Based on market analysis using Burning Glass, jobs identified for horticulture-related science and production/management at the bachelor's level is around 156,000 nationwide with modest growth projected in the next 10 years. Most jobs are in the "green industry" of landscaping and gardening and to a lesser extent in biological science, and as production technicians and assistants. However, there were more positions posted for 2019 in Biological Science (3,960) than Landscaping and Gardening (3,853) indicating that employers may settle for applicants with less than bachelor's degrees to fill the needs of the green industry. Biological Science jobs had entry level salaries over $10,000 more than those in Landscaping and Gardening ($50,807 vs. $38,507), both above the regional average living wage of $31,450. Both areas show strong salary increments with experience. Specific skills in demand by employers are budgeting and project management with baseline skills of communication and organization.

The American Society for Horticultural Science (ASHS) and Longwood Gardens engaged Fleishman-Hillard, a nationally recognized communications and marketing firm, to conduct research to determine the public perception of horticulture and careers in horticulture. Through stakeholder focus groups and general public online and phone surveys, the importance of horticulture, career perceptions, and the need for the promotion of horticulture were examined. It was determined that the availability of qualified applicants to fill horticulture enterprise management and skilled labor positions in the U.S. is inadequate and such a shortage is expected to become an even greater issue in the future. The study report stated that "given the number of benefits associated with the industry—available jobs, science/technology, environment and human benefits, working outdoors, etc., all benefits valued by millennials (persons reaching young adulthood around the year 2000) and other youth audiences, communicating these attributes can help pique individuals' interest in the field. Interesting, challenging, and impactful careers are available in horticulture at all levels, and there is an increasing need for educated, well-trained students."

The study also showed that limited public awareness is one of the biggest challenges facing horticulture. This research found strong support for promoting horticulture, now branded the Seed Your Future campaign. This program to promote horticulture presents a youthful, fresh face for students in middle and high school, and where possible, elementary school is supported by ASHS, botanical gardens and industry organizations and companies. By showcasing horticulture's innovation with science, technology and the breadth of work taking place across the industry that can impact major, global issues, it is hoped that a greater awareness of horticulture is being created.
ASHS, through this study, has shown that successful university horticulture programs of the future will partner with this national promotional program in recruiting qualified students. Universities will provide curriculum to provide horticultural science knowledge for a life-long career as well as the skills required for entry-level positions. They will link students to the profession and expose them to industry segments through a range of experiential learning activities.

### *Composition of Student Enrollment and Recent Graduates*

Those enrolled in HPLS with horticulture options are mostly domestic students that hail from Kentucky, the Midwest, and many regions of the country. Students represent a mix of urban and rural backgrounds. From 2014-2019 there were between 36%-43% female students and between 1%-8% minority students **(Table 9)**. Addressing this relatively low level of minority students should be a focus in future strategic recruiting efforts. In HPLS, as well as CAFE as a whole, many students enter college ill prepared in science and math. The university has good programs in place to assist students gain math proficiency. Placement tests evaluate math skills and place students in appropriate credit or remedial courses. Most students are able to achieve the level of competency in math required MA 123 – Elementary Calculus, but some must take MA 109 – College Algebra or even remedial math courses to achieve competency. Based on student advising experience, most of our students struggle more with basic chemistry than with the required math. Both horticulture options currently require two semesters of general chemistry and labs (CHE 105/107 and CHE 111/113). However, many applied science programs in CAFE have opted for less arduous and more applied chemistry classes and have found that their students have competency sufficient for future courses and their careers.

**Table 9. Student Enrollment Demographics***

| Fiscal Year | % female | % minority |
|---|---|---|
| **2014** | 41% | 8% |
| **2015** | 36% | 1% |
| **2016** | 37% | 4% |
| **2017** | 38% | 3% |
| **2018** | 37% | 2% |
| **2019** | 43% | 1% |

*Includes students enrolled in HPLS BS and IPSS graduate programs

### *Curriculum Development*

The current HPLS major sheet is provided in **Appendix G** (http://www.uky.edu/registrar/Major-Sheets/MS1617/afe/hps.pdf). The University of Kentucky requires all students to fulfill core requirements in 10 areas. Where possible, core courses are suggested that also fulfill pre-major and major requirements. The major requires 120 hours for graduation. With planning and attention to advisor recommendations, students entering the program as freshmen can graduate in four years. However, many students transfer to HPLS from other majors within the university or from other institutions. Such students take longer to graduate. For the most part, all students, regardless of option, satisfy the same pre-major and major requirements. Each option has a set of required classes within the major with additional specialty support requirements. For Horticulture Enterprise Management, students complete 23 hours of PLS (within major) classes and 21 hours of specialty support. The specialty support courses allow the student and advisor to tailor the curriculum to the student's career objective. Many students choose to use these courses to help fulfill a minor in areas such as Agricultural Economics, Sustainable Agriculture, and others, or complete a certificate such as Distillation, Wine and Brewing Studies. Students may also choose to emphasize courses from finance, management, or business administration. Students in the Crop, Soil and Horticulture Science option generally take less courses in the major (PLS) to concentrate on a broader exposure to the sciences (biology, chemistry, physics).

### *Horticultural Science Program*

Although the Horticultural Science undergraduate program will not formally begin until fall 2020, a comparison between it and HPLS can be found in **Appendix H**. Considerable thought has already been invested in assessing strengths, challenges and opportunities for the new HRT program. These include:

Strengths:

- The HRT program will allow recruitment and marketing independent of the Plant and Soil Science Department and provide higher profile exposure to horticulture
- Horticulture faculty will more easily manage the degree program and can react more quickly to student needs and program assessment recommendations
- The comradery among HRT students is expected to increase
- The HRT program can better interface with the student Horticulture Club to promote social interaction among students and use the club to assist with student experiential learning (travel experiences, plant production and sales, leadership development)

Challenges:

- The department and college must invest resources into promotion, recruitment, and retention in HRT
- Turnover in faculty due to retirement could result in loss of subject expertise in teaching
- When faced with decreasing revenue, teaching must retain a high priority for funding

Opportunities:

- A revised curriculum could include one or more required core classes taken each year by all HRT majors (regardless of option) to promote more of a cohort identity among students within the major
- Tracks within each option (Horticulture and Plant Science/Horticulture Plant Production and Management) can be identified (Greenhouse management, Landscape management, Public horticulture, Fruit and Vegetable production) that would better allow students to identify career options and also assist in recruitment
- Anticipated turnover in faculty due to retirement will allow an emphasis on teaching skills and innovations when hiring new faculty
- The department might implement more courses that fulfill UK Core requirements to aid in recruitment and contribute to funding with the new tuition revenue model
- The department might expand distance learning which in some cases may increase efficiency of teaching and may be financially beneficial to the HRT program

### *Student Success Measures and Outcomes*

The Horticulture, Plant and Soil Science Program Assessment Plan is provided in **Appendix I**. This document outlines the mission, vision, goals of the program; lists learning outcomes; maps the outcomes to the curriculum; provides assessment methods, measures and guidelines for data collections; assesses teaching effectiveness; and provides plans for evaluation of post-graduate student success. This plan was developed in 2015, and an updated plan will be developed with the revised Horticultural Science curriculum.

The student learning outcomes of the program include:

1. Students will acquire and demonstrate proficiency in scientific and technical principles of the plant, soil, and environmental sciences and illustrate their interrelatedness.
2. Students will communicate clearly in oral and written formats.
3. Students will demonstrate the critical thinking skills required to define a problem, retrieve and evaluate information, and propose and evaluate potential solutions.
4. Students will be able to explain and discuss agricultural production from a global perspective.
5. Students will obtain the foundational skills for lifelong learning.

Tracking success of students and job placement after graduation is coordinated with the Office of Institutional Research and the CAFE career officer to generate an Alumni Survey of post-graduate employment and/or graduate education.

### *Delivery of Instruction*

Currently,13 departmental faculty and staff have teaching responsibilities. These individuals and courses taught are listed in **Table 10**. Classes are taught in the Horticulture, Plant and Soil Science program, Distillation, Wine and Brewing Studies certificate program, and the interdisciplinary programs, Sustainable Agriculture and Community Food Systems, and Agriculture and Medical Biotechnology.

**Table 10. Current Faculty and Staff with Teaching Responsibilities and Course Information**

| Name | Course |
|---|---|
| Archbold, Douglas | PLS 520 Fruit and Vegetable Production |
| DeBolt, Seth | PLS 335 Distillation, Wine and Brewing Science |
| Downie, Bruce A. | ABT 301 Writing and Presentations in the Life Sciences |
| Durham, Richard | PLS 203 Home Horticulture, PLS 220 Introduction to Plant Identification<br>PLS 490 Capstone in Plant and Soil Science |
| Fountain, William | PLS 451 Landscape Management and Arboriculture |
| Geneve, Robert | PLS 320 Woody Horticulture Plants, PLS 440 Plant Propagation, PLS 490 Capstone in Plant and Soil Science |
| Ingram, Dewayne | PLS 100 Intro to Horticulture Professions, PLS 525 Nursery and Floriculture Production |
| Jacobsen, Krista | SAG 201 Sustainable Agriculture and Community Food Systems, SAG 490 Integration of Sustainable Agriculture Principles |
| Lopez, Carlos | ABT 301 Writing and Presentations in the Life Sciences |
| Pook, Victoria | PLS 335 Distillation, Wine and Brewing Science |
| Scott, Ruth | PLS 240 Introduction to Floral Design, PLS 340 Floral Design for Life's Events |
| Wheeler, Jeff | PLS 336 Introduction to Viticulture – Grape Production, PLS 337 Introduction to Enology |
| Williams, Mark | SAG 397 Apprenticeship in Sustainable Agriculture |

Most horticulture faculty continue to use traditional synchronous classroom lectures and laboratories for instruction. Some faculty members have incorporated pedagogical innovations in their courses. In PLS 320 – Woody Horticultural Plants, a flipped classroom approach is used to introduce students to culture and use characteristics of woody plants. Students access information regarding culture and use of plants though PowerPoint presentations outside class using Canvas (UK's course management program) and then meet face-to-face for discussion. Students continue to be introduced to a large lists of plants and obtain competence in plant identification through guided plant walks on campus to view live material. In PLS 525 – Nursery and Floriculture Crop Production, lectures are streamed live and recorded so that county agents pursuing graduate degrees can enroll in the course and participate in lectures without traveling to campus. In PLS 490 – Capstone Horticulture, a GCCR (Graduation

Composition and Communication Requirement) course, students engage in multimodal communication activities by leading group discussions, shadowing and interviewing horticulture professionals, developing a business plan complete with a written component, website, and PowerPoint presentation.

### *Student Horticulture Club*

Two faculty and one staff person provide guidance and supervision for our departmental student club https://www.facebook.com/UKHorticultureClub/. This club provides the atmosphere and means for students to gain additional knowledge, experience, and friendship beyond the classroom environment. The Horticulture Club meets weekly during the semester and students attend as their schedules allow. Activities include programs on diverse horticulture subjects, local field trips, student-initiated projects, work sessions, and social gatherings. The Horticulture Club engages in specialty plant sales and fund-raising events each year to partially fund domestic and international study trips.

## Distillation, Wine and Brewing Studies Certificate

During the past decade, the University of Kentucky has invested in faculty, resources and farmland to serve emerging distillation, wine and brewing (DWB) industries. Starting in 2011, Dr. Seth DeBolt in our department created a class in Distillation, Wine and Brewing Science. The immediate popularity of this course, along with broad support from the industry and university community allowed Dr. DeBolt to lead the development of a DWB certificate program in 2014. This unique and highly successful program provides University of Kentucky students with a knowledge of a multi-billion dollar international industry with a myriad of dynamic career opportunities (https://dwb.ca.uky.edu).

The certificate program brings together faculty from three colleges and seven departments to offer students a multidisciplinary education leading to career opportunities in the industry. The program draws students from around our university and beyond through in-person and online classes. The curriculum requirements can be found at https://dwb.ca.uky.edu/requirements. Students must complete two required courses [PLS 335 - Distillation, Wine and Brewing Science (3 credits); A&S 306 - Spirit Chemistry (3 credits)], in addition to two elective courses from a list of related classes (3 credits each), for a total of 12 credit hours. An online version of the program began in fall, 2019 and is quickly gaining in popularity. There are currently 12 classes that have been created or modified for the certificate.

Growth began as a single PLS 335 class of 30 students in 2011. This has evolved into 10+ classes with spring, fall and summer enrollments. These 10+ classes accommodated 555 students in 2019, with another 15 in research specific classes, and currently all classes are over-enrolled. An advantage has been nesting the undergraduate certificate within all major colleges on campus. This allows students to get a major degree in a defined discipline and also get the career focused certificate. Additionally, we have a global industry based in Kentucky.

The growth of the industry and potential for innovation requires a regional workforce to advance sustainability and innovation. Career options are broad and range from business and marketing, to personnel technically trained in STEM disciplines with backgrounds in distillation, wine and brewing. The program uses a combination of online resources for recruiting and there is strong participation by faculty during career fairs and industry conferences. Each year since 2018, the program hosts a 300+ student career fair and the first industry conference hosted 500 participants with 25-50 students volunteering and presenting. Although the program is fairly new, it is having excellent success in preparing and placing students into careers in the industry.

## Faculty and Staff Teaching-Related Awards and Recognitions

Examples of quality, impact and recognition for our faculty and staff include college, university, regional, national, and international level awards.

- UK Provost's Award for Outstanding Teaching (Mark Williams, 2015)
- Teacher Who Made a Difference, University of Kentucky College of Education (Krista Jacobsen, 2016)
- Women in CAFE Instruction Empowerment Award (Krista Jacobsen, 2016)
- Master Teacher Award. University of Kentucky, College of Agriculture, Food and Environment (Krista Jacobsen, 2017)
- Master Teacher Award. University of Kentucky, College of Agriculture, Food and Environment (Mark Williams, 2018)
- Lexington-Fayette Urban County Government Environmental Commission Award (Shari Dutton, 2019)

# Departmental Research Program

## Overview

Horticulture production in Kentucky, across the United States, and around the world is facing significant issues associated with demands for increased yield and production efficiency in the face of an increasingly unpredictable climate, an expanding population, and increased interest in plant-based diets. Additionally, horticulture crops are ideally suited to address the diet-related health issues that are plaguing our state and country. A need for science-based research with an over-arching goal of advancing the sustainability of our food system while improving human health prominently impacts our research programs.

Departmental research over the last six years has focused on contributing fundamental knowledge to the fields of horticultural plant science and horticulture crop production. While research has been focused on the acquisition of basic knowledge, endeavors have spanned the spectrum from basic to applied science, with an emphasis placed on multidisciplinary and systems-based approaches to problems in these diverse areas. There are currently 16 faculty members in the department and the current faculty research FTE is 5.77 in 2019-2020 (**Table 11).** Historically faculty with majority DOE in research and an active Hatch project have been provided with a Technical staff support position; however, this has not been possible with all new appointments and is an area of concern.

Research in our department currently focuses on the following areas:

- *Fruit crop physiology and production*: Evaluating carbohydrate metabolism and its impacts on yield and harvest quality, postharvest quality and phytochemical content.
- *Cell wall physiology and biochemistry*: Characterization of the fundamental mechanisms by which plants create shape and form structure, focusing on structural carbohydrates and the myriad of ways these can be used by humans.
- *Seed biology*: Elucidating the biochemistry of seed longevity (how the seed survives dehydration) and seed germination (what processes are required to allow some portion of the embryo to protrude from the seed), through a focus on Late Embryogenesis Abundant (LEA)

proteins, the protein partners with which they preferentially interact, and the influence of soluble, non-reducing carbohydrates on longevity in the dehydrated state.

- *Plant propagation and production*: Seed biology/technology and vegetative cutting propagation/production in specialty and emerging crops and vegetative propagation involving aspects of stock plant management (epigenetics) and foliar auxin application to cuttings.
- *Agroecosystem management*: Examining how rotation, diversification, cover crops and conservation tillage affect soil quality, nutrient cycling, plant productivity and economic viability at various farming scales.
- *Organic production*: Evaluating and developing sustainable organic horticulture production systems, with a focus on pest management and soil health.
- *Plant biochemistry*: Elucidating mechanistic, structural and functional aspects of the post-translational methylation of Calmodulin.
- *Environmental genomics*: Evaluating plant/microbiome and epigenome/environment interactions in crop and wild species.
- *Plant breeding*: Assessing host-plant resistance to insects, especially in wild relatives of tomato. Design of a production/marketing system for a *Capsicum baccatum* specialty pepper.
- *Nursery and greenhouse production:* Analysis of nursery and greenhouse crop production system components in terms of global warming potential, water use, and variable costs utilizing life cycle assessment.

**Table 11. Horticulture Research Faculty and Staff (2019-2020)**

| Category | Total |
|---|---|
| Research faculty (FTE) | 5.77 FTE |
| Research staff | |
| Research Analyst | 8 (total number) |
| Farm Superintendent | 1 |
| Lab Tech Senior | 2 |
| Ag Research Specialist | 2 |
| Research Farm Tech II | 1 |
| Research Analyst Principal | 1 |
| Research Farm Tech III | 1 |
| **Research staff total:** | **16** |
| Postdoctoral researcher & graduate students | |
| Postdoctoral researcher | 2 |
| PhD student | 6 |
| MS student | 2 |
| **Postdoctoral and graduate total:** | **10** |
| Visiting Scholar | **4** |

## Research Productivity Measures

### *Research Funding*

While the department averaged 5.33 FTE in research since 2014, we have been successful in acquiring competitive funding, with $8,856,482 total in extramural grants as PI since 2014 (**Table 12**). We have typically been in the top half of college departments (14 total) in awards (PI) per FTE and notably are the top department in the college in that category over the period 2018–2020. Many of our faculty now have federal competitive grants as PI and one of our colleagues, Seth DeBolt, has one of the highest funding levels in our college. This sustained level of funding is indicative of the competitiveness and quality of our research program. Additionally, many research faculty also serve on national grant review panels for funding agencies such as USDA, DOE, and NSF.

| Table 12. Research Fiscal Year Grants (Sponsored Projects Awards through UKRF)[a] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Items | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2014-2019 | 2019-2020 |
| Research FTE | 5.79 | 5.42 | 5.18 | 4.7 | 5.56 | Ave: 5.33 | 5.77 |
| Awards as PI | $1,572,989 | $854,489 | $1,124,464 | $943,107 | $4,361,433 | $8,856,482 | N/A |
| Awards as Co-PI | $1,730,991 | $8,987,706 | $509,776 | $5,562,312 | $4,468,458 | $21,259,243 | N/A |
| Total awards | $3,303.980 | $9,842,195 | $1,634240 | $6,505,419 | $8,829,891 | $30,115,725 | N/A |
| %Federal Competitive (PI) | 8% | 43% | 13% | 5% | 82% | Ave: 30.2% | N/A |
| Awards per research FTE (PI) | $271,673 | $157,654 | $217,077 | $200,661 | $784,430 | Ave: $326,299 | N/A |
| Awards per research FTE (PI) college rank | 5 | 7 | 6 | 6 | 1 | - | N/A |

[a]Data are from yearly departmental reports and yearly college composite reports (https://administration.ca.uky.edu/files/hort_2019.pdf, https://administration.ca.uky.edu/files/composite.pdf)

### *Hatch and Multistate Projects*

The following are current Hatch and Multistate projects for faculty in HRT:

- Environmental and Genetic Determinants of Seed Quality and Performance – Geneve, R
- Advancing Plant Biotechnology for the Kentucky Bioeconomy – DeBolt, S
- Harnessing Epigenetic Memory Stress for the Development of Locally Adapted Cultivars in Perennial Crops – Lopez, C
- Sorbitol and Ribitol Biosynthesis and Metabolism During Abiotic Stress in Tomato (*Solanum lycopersicum* L.) – Archbold.
- Improving Economics and Environmental Sustainability in Tree-Fruit Production Through Changes in Rootstock Use – Archbold, D
- Identification and Analysis of Proteins Interacting with Late Embryogenesis Abundant Proteins – Downie, A
- Evaluating Conservation Practices for Ecological Intensification of Organic High Tunnel Production Systems – Jacobsen, K
- Introgression of Zingiberene and Type IV Trichome Density from Wild, Insect-resistant *Solanum habrochaites* Accession LA2329 into Cultivated Tomato, *S. lycopersicum* – Snyder, J
- Alternative Management Methods to Enhance Sustainability of Kentucky Vegetable Production Systems -Rudolph, R
- Sustainable Practices, Economic Contributions, Consumer Behavior and Labor Management in the U.S. Environmental Horticulture Industry – Ingram, D

### *Research Publications*

Scholarly productivity in research is measured by number of publications, quality of publications as indicated by journal impact factor, and citation rate. Although several of our faculty publish in some of the highest rated/ranked journals in their fields, one area for improvement is in peer-reviewed publication, where we have typically been in the lower half of departments in the college in publications per FTE (**Table 13**). The influx of new faculty (two hired in the last two years), and opportunities for future hires will hopefully lead to increased publication productivity.

An additional example of the quality and productivity of the department is that our research faculty members serve on editorial boards and/or as editors for several journals including:

- Editorial Board member for *Scientia Horticulturae*. Dr. Robert Geneve
- Editorial Board member for *Propagation of Ornamental Plants*. Dr. Robert Geneve
- Associate Editor for *Journal of Seed Technology*. Dr. Robert Geneve
- Associate Editor for *Frontiers in Plant Physiology*. Dr. Seth DeBolt
- Associate Editor for *Botany*. Dr. Bruce Downie

Collectively these data and observations indicate that Horticulture research faculty are not only productive in research, communicating high quality research findings, but that their international reputations for doing so have been recognized, leading to, among other responsibilities, editorial leadership positions.

**Table 13. Research Publications**

| Items | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2014-2019 | 2019-2020 |
|---|---|---|---|---|---|---|---|
| Research FTE | 5.79 | 5.42 | 5.18 | 4.7 | 5.56 | Ave: 5.33 | 5.77 |
| Refereed journal articles | 20 | 33 | 17 | 23 | 17 | 110 | N/A |
| Book chapters | 1 | 2 | 1 | 1 | 2 | 7 | N/A |
| Pubs per research FTE (PI) | 3.62 | 6.46 | 3.47 | 5.10 | 3.42 | Ave: 4.41 | N/A |
| Pubs per research FTE (PI) college rank | 11 | 3 | 10 | 8 | 10 | - | N/A |
| PhD | 1 | 4 | 1 | 1 | 3 | 10 | N/A |
| MS | 3 | 3 | 0 | 1 | 1 | 8 | N/A |

### *Graduate Student Training*

Graduate training in our department occurs through the Integrated Plant and Soil Science Graduate Program (IPSS). This joint program between Horticulture, Plant and Soil Science, and Forestry and Natural Resources offers opportunities for students pursuing thesis and non-thesis MS, and PhD degrees. During the period under review, departmental faculty graduated 10 PhD and 8 MS students **(Table 13).** Details regarding the program, including course requirements, learning outcomes, and organizational structure can be found at https://ipss.ca.uky.edu. Students enrolled in the IPSS program must meet the minimum requirements of the Graduate School for the awarding of MS (24 graduate credit hours) and PhD (36 graduate credit hours, of which at least 18 credit hours must be taken in residence) degrees. IPS 610 and 625 are interdisciplinary, topic-driven courses, interfaced with current seminar programs in the plant and soil science disciplines. Each student will also be required to enroll at least once in PLS 772 Seminar in Plant and Soil Sciences (1 credit). While enrolled in PLS 772, students must present their research at the department symposium to demonstrate their competence in public presentation skills. Remaining credit hours outside of the core coursework are individually developed by the graduate student in conjunction with their advisor and committee. During 2014-2019, our department advised a total of 8 M.S. and 10 Ph.D. students who graduated from the IPSS program. For comparison, an overview of the total degrees and enrollment in the IPSS program during 2014-2019 can be found in **Tables 14** and **15**. In addition, about we have had several post-doctoral researchers (currently two) and national or international visiting scholars (currently 4). Increasing the

number of graduate students, and in particular post-doctoral scholars, has been identified as a growth area and need. With this in mind, the amount of available space for graduate students and post-docs in the Plant Science Building (PSB) is inadequate and does not allow for future expansion. There are currently three students and one post-doc located in a corner office previously used by one person. In another room there are five persons (two of whom are from the Entomology department that Horticulture has been asked to accommodate) where previously there were only three. Continued success of the Horticulture faculty in the PSB in acquiring students, postdocs, visiting scientists, will exacerbate this shortage. We have economized and have worked with other units to meet current conditions but when considering where new people will physically be located is becoming an insurmountable hurdle.

| Table 14. Degrees Awarded Five-Year Trend | | | | | |
|---|---|---|---|---|---|
| | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
| IPSS MS (w\ Crop Science MS) | 10 | 9 | 6 | 7 | 7 |
| IPSS PhD (w\ Crop, Soil, Physio PhD) | 9 | 8 | 7 | 9 | 7 |

| Table 15. Enrollment Five-Year Trend | | | | | |
|---|---|---|---|---|---|
| | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
| IPSS MS (w\ Crop Science MS) | 28 | 25 | 23 | 25 | 18 |
| IPSS PhD (w\ Crop, Soil, Physio PhD) | 43 | 45 | 45 | 38 | 39 |

## Faculty and Staff Research-Related Awards and Recognitions

Examples of quality, impact and recognition for our faculty and staff include college, university, regional, national, and international level awards.

- International Plant Propagators' Society (IPPS) Eastern Region Award of Merit (Robert L. Geneve, 2014)
- Thomas Poe Cooper Research Award (Seth DeBolt, 2015)
- Dr. BP Pal Distinguished Chair Award by the Indian National Science Academy (INSA) (A. Bruce Downie, 2015)
- Eastern Region International Plant Propagators' Society Fellow Award (Winston Dunwell, 2015)
- International Plant Propagators Society, Fellow inductee (Winston Dunwell, 2015)
- National Regional Award for activities as a member of N_1186: Water Management and Quality for Ornamental Crop Production and Health, Association of State Agriculture Experiment Station Directors (Winston Dunwell, 2017)
- University Alumni Professorship (Seth DeBolt, 2018)
- National Research Network for Low Carbon, Energy and Environment, Proposal Writing Fellowship (Carlos Rodriguez Lopez, 2018)
- Southern Nursery Association Researcher's Porter Henegar Memorial Award (Robert Geneve, 2020)

## Notable Research Accomplishment

In 2019, the research and teaching efforts related to the distilled spirits industry by Dr. Seth DeBolt culminated in a $5 million gift to the University of Kentucky to establish the James B. Beam Institute for Kentucky Spirits. This was followed in early 2020, with the Independent Stave Company Boswell Family providing a $1 million gift for a maturation facility adjacent to the Institute. The collective impacts of the Beam Institute will educate the next generation of distillers through a curriculum that covers the skills needed to succeed in the distilled spirits industry at the undergraduate, graduate and professional levels. The James B. Beam Institute for Kentucky Spirits will offer courses across engineering, chemistry, business, law, horticulture, forestry, food science, and entomology to address spirits industry needs in sustainable agriculture, research and development, and more. More information regarding this groundbreaking accomplishment can be found at: https://beaminstitute.ca.uky.edu/home. https://news.ca.uky.edu/Independent%20Stave%20Company%20and%20the%20Boswell%20family%20give%20%241%20million%20for%20spirits%20maturation%20warehouse%20at%20UK

## Opportunity for Future Research Development

The department is entering a period of rapid faculty turnover through multiple retirements in the period during which the recommendations from this study will be implemented. The expertise recruited to fill these positions will have a long-term impact on the department research direction and areas of focus. One area of interest is the acquisition of research capacities to participate with those involved in human health to elucidate how plant-based diets modulate the gut microbiome towards a favorable diversity of bacterial species. Whether and how such a favorable gut microflora may impact microbiome-related pathways to subsequently improve human body mass index and cardio-vascular health would be the primary goals of such research. Obesity and heart disease are prevalent state-wide. Our department has a history of successful engagement in multidisciplinary projects and a foundation in investigating complex interactions between plants and microbial symbionts. Convening larger, multi-disciplinary teams spanning across departments/colleges, at and beyond UK, in order to investigate how horticulture crop consumption can favorably alter the microbiome resulting in better human health is the next step we will be taking.

# Departmental Extension Program

## Overview

The Horticulture Extension Program is conducted by six Extension faculty (4.46 current FTE), five Extension Specialist staff and six Extension Associates (**Table 16**). One faculty Extension Specialist retired in early 2019 and is on a two-year phased retirement, ending in December 2020. A new Controlled Environment Extension faculty will begin on May 1, 2020. Horticulture extension personnel provide resources for Horticulture, Agriculture and Natural Resource, Family Consumer Science and 4-H Youth and Development Extension Agents which enables them to help the citizens of the Kentucky Commonwealth. Extension personnel also work with Extension personnel outside the state to enhance grower and consumer education across the U.S. and world. Commercial horticulture educational programs are primarily commodity oriented and cover a multitude of diverse crops, which are often coordinated within the department and with many CAFE departments. Some programs focus on consumer and youth horticulture, marketing and food safety. In addition, an Extension Specialist has worked to promote international collaborations and technical assistance in sustainable horticulture since 2013. Horticulture Extension Faculty, Staff and Extension Associates made between ¼ and 1 million direct and indirect contacts annually during this review period.

Substantial funding for Horticulture Extension programs, Research Farm operation (Horticulture Research Farm, UK Research and Education Center, and Robinson Center for Appalachian Resource Sustainability) and on-farm demonstrations has been obtained from the Master Tobacco Settlement Agreement distributed from the Kentucky Agricultural Development Fund through the Kentucky Horticulture Council (KHC, https://kyhortcouncil.org/) and the Kentucky Wineries Association (KWA, http://kentucky.wine/). The KHC represents the horticulture industry within the state, which includes fruit, vegetable, nut, turf grass, nursery, organic, bedding plant, and greenhouse growers. The KHC focuses on promoting and supporting the growth of Kentucky horticulture to Kentucky citizens, state legislators, senators and representatives to the US Congress, university leaders, and other state and federal agencies. The hiring of KHC Executive Director, Dr. Cindy Finneseth in 2018 has been particularly helpful in conference program development, developing grower buyer meetings, hosting water quality field days and in coordinating and enhancing horticultural extension programs. Extension faculty and staff also seek extramural funding to support their Extension and applied research programs.

**Table 16. Extension Faculty and Staff Listing**

| Name | Title | Specialty |
|---|---|---|
| Becker, Daniel | Ag Extension Associate | Vegetable Production |
| Berberich, Stephen | Ag Extension Associate Senior | Floriculture |
| Cassady, Christy | Ag Extension Specialist | Center Director |
| Dunwell, Winston | Extension Professor | Nursery Production |
| Durham, Richard | Extension Professor | Home Horticulture |
| Fountain, William | Extension Professor | Arboriculture |
| Ingram, Dewayne | Extension Professor (post-retirement) | Nursery Production |
| Kight, Joshua | Ag Extension Associate | Nursery Production |
| Knight, Joshua | Ag Extension Associate Senior | Nursery Production |
| Lynch, Sean | Ag Extension Associate | Viticulture/Enology |
| Rowell, Brent A. | Ag Extension Specialist Principle | International Agriculture |
| Rudolph, Rachel | Assistant Extension Professor | Vegetable Production |
| Smigell, Christopher | Ag Extension Associate | Fruit and Vegetable |
| Strang, John | Extension Professor | Fruit and Nut Production |
| Wilson, Patsy | Ag Extension Specialist | Viticulture/Enology |
| Wheeler, Jeffrey | Ag. Extension Specialist Senior | Viticulture/Enology |
| Wright, Shawn | Ag. Extension Specialist Senior | Vegetables |

## Extension Programs (2014-2020)

The following is a brief overview of the primary extension programs and activities that we have conducted during the review period.

### *Master Gardener Program*

The Master Gardener program is a volunteer management and outreach program of the Cooperative Extension Service. Before becoming a Master Gardener, participants are provided at least 24 hours of training in aspects of home horticulture. Once the training has been completed, volunteers assist County Extension Agents with educational programming. Currently Master Gardener programs are active in over 50 Kentucky counties and involve over 1,445 active Master Gardeners that provide over 43,000 volunteer service hours annually based on a 2015 value estimate survey from Independent Sector (www.independentsector.org). Master Gardeners provide over 83,000 direct and 260,000 indirect contacts per year. In 2015 and 2016 Master Gardeners conducted 320 educational classes.

Departmental faculty members in the horticulture department involved in the Master Gardener program include, Rick Durham, Bill Fountain, John Strang, Winston Dunwell, Rachel Rudolph and Shawn Wright as well as Faculty, Extension Associates and Staff in cooperating departments, Ric Bessin (ENT), Nicole Gauthier (PPA), Emily Pfeufer (PPA), Julie Beale (PPA) and Kimberly Leonberger (Extension Agent) and Matt Springer (Extension Agent).

### *On-farm Technical Assistance*

Extension Associates and Specialists provide direct technical assistance for individual farm families to establish new and to expand established horticulture enterprises. This program has been supported over the last five years by the Kentucky Horticulture Council and the Kentucky Agricultrure Development Fund through $2.9 M in grants. The Extension Associates conducted an average of 21 on-farm demonstrations per year during this review period. On-farm Extension Associate technical assistance contacts may be found in **Table 17**. It should be noted that the number of on-farm demonstrations per Associate went down due to fewer Extension Associates (7 in 2014 down to 5 in 2018/19) as well as a shift in focus to more presentations, newsletter articles, blogs and online resources.

**Table 17. On-farm Technical Assistance Program Extension Associate Contacts**

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Six – year Total |
|---|---|---|---|---|---|---|---|
| Programs/Presentations | 36 | 20 | 28 | 21 | 25 | 29 | 159 |
| Number of Farmers Present at Presentations | 1,443 | 988 | 966 | 755 | 951 | 2,553 | 7,656 |
| On-farm/Face-to-Face Visits | 578 | 605 | 664 | 559 | 291 | 350 | 3,047 |
| On-farm Demonstrations | 31 | 30 | 21 | 22 | 12 | 13 | 129 |
| Individual Contacts other than Face-to-Face | 3,376 | 3,201 | 3,310 | 2,104 | 654 | 889 | 13,534 |
| Field Days/Tours | 21 | 18 | 24 | 6 | 26 | 7 | 102 |
| Number of Farmers Present at Field Days/Tours | 220 | 484 | 335 | 98 | 280 | 80 | 1,497 |
| Newsletter Articles/Blog Posts/E-newsletters | 13 | 19 | 60 | 88 | 72 | 85 | 337 |
| Online Views/Contacts | 102,454 | 91393 | 185,862 | 120,182 | 112,452 | 101,303 | 713,646 |

Extension Faculty, Staff and Extension Associates involved with this program include, Dewayne Ingram, Rachel Rudolph, Winston Dunwell, Shawn Wright, Joshua Knight, Joshua Kight, Carry Grable, Chris Smigell and Steve Berberich.

### *High Tunnel Program*

Since 2012, over 1,000 high tunnels have been installed in Kentucky using the High Tunnel System Initiative of the Natural Resource Conservation Service Environmental Quality Incentives Program (NRCS EQIP). Many Kentucky growers have been able to take advantage of the low-cost (or free) addition to their farm. High tunnels have the potential to provide growers with the ability to extend the growing season, moderate the environment with respect to precipitation and temperature, and improve vegetable quality. However, many growers are unfamiliar with how to most effectively use their high tunnels and make the most out of the potential season extension. The funding available through NRCS has opened high tunnel ownership to a wider social and economic stratum; it has included people that

may not normally be able to afford a high tunnel or who are not experienced growers. A guide has been developed for high tunnel growers: An IPM Scouting Guide for Common Problems of High Tunnel and Greenhouse Vegetable Crops in Kentucky (ID-235). It was first developed in 2015 and was revised and updated in 2018. **Table 18** shows High Tunnel Funding coming to the deaprtment, Presentations and Number of Participants

| Table 18. High Tunnel Funding, Presentations and Number of Participants | | | | | | |
|---|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Funding | | | | | | $135,371 |
| Number of Presentations/Workshops | - | 2 | 3 | 1 | 11 | 15 |
| Number of Participants | - | 35 | 120 | 30 | 449 | 426 |

Extension Faculty and Staff involved in the High Tunnel Program are Rachel Rudolph, Brent Rowell, Shawn Wright, John Strang, and Ben Yates.

### *Vegetable Production Program*

Since the Tobacco Master Settlement Agreement (MSA) was enacted in 1998, many Kentucky growers have turned to vegetable production as an alternative to tobacco. Extension programming and workshops have been in high demand because vegetable crops require skilled management and often hands-on labor for their production, harvest, and proper storage. The learning curve has been high for many Kentucky growers as they transitioned from cropping systems that they knew well, such as tobacco or grain crops. However, in the 22 years since the MSA became effective there are many successful vegetable producers across the state. Like the skill level of the growers, the size and scale of the operations vary greatly. All producers, regardless of their skill level or size of operation, struggle with similar issues - pest and pathogen pressure, soil quality, as well as variable and non-conducive weather patterns. Regardless of the crop, production systems must continuously evolve in order to stay resilient and sustainable in an ever-changing environment, whether that environment be economic, social, or natural. Many of the requests for vegetable programming across the state includes information and guidance on tomato production, such as the prevention and management of tomato abiotic disorders. Additional popular topics include soil fertility management, implementing cover crops into vegetable production, evaluation of new or previously untested cultivars, utilizing and implementing row cover and low tunnels for season extension, and guidance on crop rotations and other Integrated Pest Management (IPM) strategies.

County agents are a key component to a successful extension program. Listening to what agents request based on their county needs helps the vegetable production extension program continue to build strong working relationships as well as ensure successful and efficient dissemination of information. Many agents rely on the specialists to visit their counties and provide information to the growers. This is not a sustainable form of information exchange as there are far fewer specialists than there are county agents. Additionally, the county agents are living and working in their communities and can better assess the needs and wants of their growers. A more effective model in a resource-constrained environment is training county agents specifically to increase dissemination of information to growers. In recent years, more focus has been placed on agent trainings in an effort to make better use of resources and capacitate agents on topics in which they are less comfortable or have not been formally trained previously. **Table 19** provides data relative to Vegetable Production Number of Programs, Participant Numbers, Agent Trainings and Number of Agent Participants.

| Table 19 Vegetable Production Number of Programs, Number of Participants, Agent Trainings and Number of Agent Participants | | | | | | |
|---|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Number of Programs | 5 | 8 | 9 | 10 | 8 | 17 |
| Number of Participants | 140 | 366 | 244 | 41 | 272 | 560 |
| Agent Trainings | 1 | 3 | 1 | 3 | 4 | 6 |
| Number of Agent Participants | 34 | 98 | 68 | 130 | 127 | 197 |

### *Fruit and Vegetable Cultivar Trial Program*

Since 2014 10 fruit and 30 vegetable cultivar trials have been conducted at our three research farms. The fruit trials were multiple year trials; NC-140 apple rootstock (2014-2020); peach NC-140 rootstock (2014-17); thornless erect blackberry (2014-18); wine and seedless table grapes (2014-20); rabbiteye blueberry (2014-15); plasticulture strawberry (2014); matted row strawberry, (2015-16 & 2019-20); haskap (2015-19) and pawpaw (2019). Vegetable cultivar trials conducted were: kohlrabi, fall broccoli, bell pepper, cantaloupe (3), triploid watermelon (3), winter squash, SE corn, plasticulture sweet corn, Bt sweet corn, green bean, broccoli (2), fall Brussels sprouts, fall cauliflower, pumpkin, sweet potato, high tunnel summer squash, high tunnel carrot, bacterial spot resistant bell pepper, black rot resistant cabbage and high tunnel beet, lettuce, kale, hops, ground cherry and rhubarb. These trial results are published in the annual Fruit and Vegetable Research Report and used to update our grower fruit and vegetable recommendations, as well as for presentations at our annual Kentucky Fruit and Vegetable Conference held in January.

The Extension faculty, Extension staff, Extension Associates and staff involved in this program are Rachel Rudolph, John Strang, Shawn Wright, Patsy Wilson, Jeff Wheeler, Chris Smigell, Daniel Becker, Sean Lynch, John Walsh, and Ben Yates.

### *Tree and Small Fruit Pruning and Training Programs*

Apples, pears, peaches, plums, cherries, grapes, blackberries, and raspberries all require pruning to produce quality fruit and to maintain plantings. Pruning is basically bud manipulation to train a plant to grow the way that the grower wants it to grow. The purpose is to develop structurally strong plants that will support a heavy fruit load, increase sunlight exposure on fruit to improve fruit color to speed plant drying in order to decrease disease incidence, enhance spray coverage, adjust crop load, reduce biennial bearing, and remove diseased tissue. Since no two plants are identical, a grower needs to learn to be creative in selecting the wood and buds to remove to improve and maintain production. Furthermore, since these are perennial crops the pruning done in one season affects production in future seasons. **Table 20** shows the number of demonstrations conducted annually and the number of participants involved.

| Table 20. Number of Tree and Small Fruit Pruning and Training Programs and Participants | | | | | | |
|---|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Number of Demonstrations | 13 | 14 | 13 | 11 | 11 | 12 |
| Number of Participants | 188 | 325 | 421 | 148 | 165 | 195 |

Faculty and Extension Associate involved, John Strang, Shawn Wright, Daniel Becker and Chris Smigell.

### *Fruit and Pecan Tree Grafting Workshops*

Fruit tree grafting workshops are conducted annually and a pecan grafting workshop is conducted occasionally through County Cooperative Extension offices across the state as needed. There is considerable interest in apple and pear tree grafting. These workshops provide attendees the opportunity to graft disease resistant and recommended cultivars that do well in the state as well as an occasional heirloom cultivar for which the name has been lost and there is sentimental value. Attendees receive instructions on grafting rationale, how to make several different types of grafts, first seasons tree care and then graft their own apple and or pear trees with a whip graft. County Extension Offices purchase the rootstocks and the scion wood is provided from the Horticultural Research Farm, the Robinson Center for Appalachian Resource Sustainability, and other orchards. These workshops have been particularly popular in the eastern part of the state. A number of agents have become proficient in grafting and conduct their own apple and pear grafting workshops. There are no clonal rootstocks for pecans so growers either purchase grafted pecan trees, or plant nuts and graft the trees to the desired varieties. Grafting demonstrations are very helpful for pecan growers that have small plantings. **Table 21** shows the number of workshops held annually and the number of participants.

**Table 21. Fruit and Pecan Tree Grafting Workshop Statistics**

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| Number of Workshops | 16 | 14 | 13 | 15 | 17 | 13 |
| Number of Participants | 316 | 258 | 211 | 200 | 282 | 273 |

Extension Faculty, Specialist and the Extension Associate involved are John Strang, Shawn Wright and Daniel Becker.

### *Kentucky Fruit Integrated Pest Management Program*

The Kentucky Fruit Integrated Pest Management (IPM) Program is conducted in cooperation with the Plant Pathology, Entomology, and Forestry and Natural Resources departments. As part of this program two meetings are held annually in commercial orchards to help train growers in current orchard production and IPM practices. Through this program, IPM Scouting Guides have been developed that contain photos of disease, insect, weed, wildlife, physiological disorder, nutrient deficiency, production, and herbicide injury problems. The guides that have been developed are: An IPM Scouting Guide for Common Problems of Apple In Kentucky, 2014; An IPM Guide for Common Problems o Strawberry in Kentucky, 2016; An IPM Scouting Guide for Common Problems of Brambles in Kentucky, 2018; An IPM Scouting Guide for Common Problems of Grape in Kentucky, 2019; and An IPM Scouting Guide for Common Problems of Peach in Kentucky to be published in 2020. These guides are accessible on mobile phones. In cooperation with the college's Agricultural Weather Center, we adapted apple, pear, peach and grape disease and insect predictive models to be more grower friendly and to operate on the 66 Mesonet and 20 National Weather Service stations across the state. The models incorporate the local 7-day forecast, which provides growers a 7-day disease prediction outlook. These models allow growers to obtain more localized pest predictive information on their home computers and mobile phones and enhances their disease and insect control.

Another program aspect, initiated in 2018, to evaluates the nutritional status of apple orchards across the state. A series of soil samples from 0–8 inches and a second series from 8-16 inches for both conventional and high-density orchards were taken from orchards across the state. Foliar samples were taken from each soil sampling area to coordinate with the soil test. In general, Kentucky apple growers have not maintained proper orchard soil fertility. The intended impact of this study is intended tohelp improve Kentucky orchard nutritional status and help growers increase fruit yield and quality in a cost

and environmentally sustainable manner. In 2017, A Profile of Commercial Apple Production in Kentucky was completed based on grower survey results.
https://ipmdata.ipmcenters.org/documents/cropprofiles/KY_Apple_CropProfile.pdf

Extension horticulture faculty and Extension Associates cooperating on this program are John Strang, Shawn Wright, Chris Smigell, Daniel Becker; Ric Bessin in Entomology; Nicole Gauthier, Kimberly Leonberger, and Cheryl Kaiser in Plant Pathology and Matt Springer in Forestry.

### *Fruit and Vegetable Pest Management Guides*

Horticulture, Entomology and Plant Pathology personnel cooperate with other states in developing regional publications. The Midwest Fruit Pest Management Guide for commercial fruit growers is a cooperative publication with 13 mid-western states that has been updated annually. This guide covers insecticide, fungicide and weed control recommendations for all of the commercial fruit crops. Purdue University makes this publication available online https://ag.purdue.edu/hla/Hort/Pages/sfg_sprayguide.aspx at no cost and printed 2,400 copies for all of the cooperating states in 2019. The Southeastern Vegetable Crop Handbook is another extensive production guide published annually in which horticulture, entomology and plant pathology cooperate with 11 other states published by Meister Publishing Company. This is also available on line at no cost https://www.growingproduce.com/southeasternvegetablecrophandbook/. In Kentucky we also publish the Vegetable Guide for Commercial Growers (ID-36).

Faculty and Extension Associates in the Horticulture department involved with these publications are Shawn Wright, John Strang, Rachel Rudolph and Chris Smigell in collaboration with Ric Bessin in the Entomology department and Nicole Gauthier and Emily Pfeufer in the Plant Pathology department.

### *Kentucky Fruit and Vegetable Conference*

The Kentucky Fruit and Vegetable Conference has been held annually for the past 40+ years. It is a two-day conference for the Kentucky State Horticultural Society (fruit growers), Kentucky Vegetable Growers Association, Kentucky Wine Association and Organic Association of Kentucky. Sessions are also included for grape growers and farmers' market venders. This meeting is a joint effort between the University of Kentucky, Kentucky State University, the Kentucky Department of Agriculture and the Kentucky Horticulture Council. The conference opens with a General Session and this is followed by a series of 4–5 concurrent sessions for the rest of the afternoon and the following day typically involving over 80 expert speakers. Registration attendance has been 537, 545, 494, 529, 517, 461 and 535 for the years 2014-2020 conferences respectively and the trade show features 52 vendors. Typically, about 60 County Extension and Horticulture Agents attend and obtain 9 CEU credits and participants have the opportunity to obtain pesticide application ceu credits for certain talks. The conference is designed to appeal to both new and experienced growers. Participants continue to attend to learn about new cultural and marketing techniques, cultivar trial results, business management, pesticide changes, organic production, Good Agricultural Practices and Produce Best Management Training updates. Many growers use the conference as a way to connect with other growers to discuss production and marketing and form new business arrangements.

Horticulture Extension Faculty, Staff and Extension Associates involved include John Strang, Rachel Rudolph, Shawn Wright, Shubin Saha, Dewayne Ingram, Mark Williams, Rick Durham, Patsy Wilson, Jeff Wheeler, Brent Rowell, Daniel Becker, Chris Smigell, Christy Cassady, Sean Lynch, Pam

Compton, Denise Stephens, Steve Diver, David Lowry, Nancy Savage, John Walsh, Ben Yates and Joseph Tucker.

### *Small Fruits Initiative Program*

The Kentucky Horticulture Council (KHC) is working with Horticulture Specialists and Extension Associates to provide technical assistance to growers in rural areas that are interested in commercial small fruit production. Eligible crops include blackberries, blueberries, currants, strawberries, elderberries, table grapes, gooseberries and June-bearing raspberries (red and black) (and possibly others, depending on the grower's unique situation). This program was funded in October 2019 through a $100,000 USDA RBDBG (Rural Business Development Grant) submitted by the KHC. Currently, 72 growers have been approved for reimbursement for supplies and/or services critical to establishment or expansion.

Cooperating Extension Specialists and Extension Associates are Shawn Wright, Chris Smigell, and Daniel Becker.

### *Grape and Wine Production Program*

Currently there are about 450 acres of grapes grown commercially for wine in Kentucky. These grapes are 85 percent hybrid, 10 percent American and 5 percent Vinifera. Seventy Kentucky wineries produce 35,680 gallons of wine annually while juice is purchased from other states to produce an additional 106,486 gallons of wine. A 2014 survey of the Kentucky industry noted that the retail value of wine was $12.8 million, and it was estimated that the full economic impact of the Kentucky grape and wine industry is $165.3 million annually. Our grape and wine program has received $1,405,791 in funding since 2014. In 2016, our viticulture and enology extension specialists partnered with the Kentucky Department of Agriculture to begin a seminar series (2/year) in grape and wine production to address the specific needs of grape producers and wine makers. Full and half-day courses were offered in sparkling wine production, modern wine chemistry techniques, effective vineyard spraying, pesticide technology, and marketing and business strategies for the vineyard and winery. Each course had over 40 attendees and seminars were conducted through the end of 2019.

Extension Specialists and Extension staff involved with this program include Jeff Wheeler, Patsy Wilson, Sean Lynch, and Nancy Savage.

### *Hard Cider Production Program*

Currently small farm wineries have limited distillation capabilities and therefore need additional products to diversify their market. Hard cider and sparkling wine are two products in high consumer demand that can help diversify the small farm winery without the need for a separate license, equipment or production facility. In 2016 Extension Specialists in viticulture and enology received funding to plant and assess 10 cider apple cultivars and four sparkling wine cultivars to determine the best management practices both in the field and winery. This is a long-term project with full harvests of the cultivar trials beginning in 2019.

Extension Specialists, Extension Associates and staff involved with this program include Jeff Wheeler, Patsy Wilson, Sean Lynch and Nancy Savage.

### *Kentucky Hop Program*

A Specialty Crop Block Grant from the USDA through the Kentucky Department of Agriculture allowed the establishment of a ¼-acre yard in eastern Kentucky at the Robinson Center for Appalachian Resource Sustainability in 2018. This is the only known metal trellis yard currently in Kentucky and has eight varieties replicated three times. This yard was one of the highlights of Mountain Ag Week in September 2018 when approximately 2,175 individuals were hosted at the Center. The Kentucky Hop Growers Alliance is a grower group that has been involved in hop production and this program supports the hop growers and the brewing industry to address current state need.

The Extension Specialist involved with the Hop Grower Alliance program is Shawn Wright.

### *Integrated Pest Management (IPM) for Nurseries, Garden Centers and Landscapes Program*

The UK IPM Nursery Crops programs target IPM training for nursery owners, their employees, and Extension Agents. The UK Nursery group create videos of nursery practices and record grant-funded IPM Workshop presentations to reach more clientele. A YouTube Channel UKREC – Horticulture was established http://www.youtube.com/user/UKRECHort. On October 23, 2012, there were 24 videos recorded, edited, rendered, and posted resulting in 36 subscribers and 32,051 views. On October 20, 2014, there were 23 additional videos with 420 subscribers and 210,300 views. Impacts of IPM programs include improved plant quality through pest and nutrient management, pruning techniques, and reduced pesticide applications that are intended to reduce the impact on the environment, human health, and climate change. The educational workshops utilized expertise from in-state and out-of-state university faculty and industry leaders, UK specialists, and Kentucky nursery owners and sites. Total 2013 and 2014 workshop attendance was 256 from four states. Attendees stated they have greater interest in growing plants for pesticide-free landscapes. The 2013–2014 average value of the workshops was $2,838 per grower. The estimated impact of the 2013 and 2014 programs (workshop attendees only) is 256 x $2,838 = $726,528; the YouTube IPM Workshop presentation viewers increase the value of the program: $567.60/presentation x 556 views =$1,577,928 as the value of the 23 KHC and IPM grant-funded videos posted in 2013-2014. This program was refunded and continued in 2015 and 2016.

Faculty and Extension Associates involved in this program include Winston Dunwell and Carry Grable.

### *Nursery Crop Development Center Program*

The Nursery Crops Development Center (NCDC) objective is to evaluate and develop plants that satisfy the need for ornamental plant diversity in the nursery plant offerings.
Specific programs include:

- *SERA - 27* (Southern Extension and Research Activities - 27: Nursery Crop and Landscape Systems). Forty of the 45 plants distributed have been evaluated at the UKREC. Twelve species were added in 2013–2014
- *Kentucky's Theodore Klein Plant Award Program.* The goal of the Theodore Klein Plant Award program is to select and promote outstanding ornamental woody and perennial plants for Kentucky Landscapes. Posters and on-line and printed publications were prepared for the http://www.ca.uky.edu/HLA/Dunwell/TKleinPA.html .
- *NCDC Native Plant Introduction Program.* To distribute information and plants to Extension Agents and the public. Focus plants for 2013-2014 were spicebush, (*Lindera benzoin*) and Kuttawa (Lyon

County) and Calloway County provenance white oak, *Quercus alba*. http://www.ca.uky.edu/HLA/Dunwell/KYNativesLndscp.html

*Woody and Herbaceous Perennial Plant Evaluations* SERA – 27, U.S. National Arboretum, Botanical Gardens and Kentucky nurseries. 61 species and cultivars.

Faculty and Extension Associate involved in this program include Winston Dunwell and Carry Grable.

### *University of Kentucky Research and Education Center Botanic Garden Program*

UKREC Botanic Gardens and all plants in evaluation are being moved to create a manageable sustainable landscape plant evaluation site containing plants under evaluation, stock plants for propagation, and serve as an educational tool. Excess plants are distributed to County Extension Offices and to Kentucky Botanic Gardens and Arboretums.

Faculty and Extension Associate involved are Winston Dunwell and Carry Grable

### *Kentucky Green Industry*

The Kentucky Green Industry has a tremendous need to train and keep employees, obtain and maintain credentials and maintain workplace safety. In light of this need the horticulture Extension Professor in Aboriculture has conducted numerous trainings to prepare arborists to pass International Society of Aboriculture (ISA) arborist certification exams. These include, Aerial Lift Specialist, Tree Worker Specialist, Utility Specialist, Municipal Specialist and Tree Risk Assessment Qualification. In addition, a Tree and Plant Appraisal Qualification certification program has been developed and implemented through the America Society of Consulting Arborists (ASCA). The UK Horticulture Department is responsible for Tree Board Training and helps with the KY Chapter ISA Annual Conference.

The Extension faculty member involved with this program is William Fountain.

### *Nursery and Landscape Winter Conference and Expo*

The Nursery and Landscape Winter Conference and Expo is a two-day event that provides technical information to nursery, greenhouse and landscape enterprise managers and employees. The program has two concurrent sessions with speakers from UK, other universities and industry leaders to cover topics jointly determined by UK and the Kentucky Nursery and Landscape Association. It has attracted 200+ nursery and landscape professionals annually.

Extension faculty and Extension Associates involved with this conference are, Winston Dunwell, Dewayne Ingram, Bill Fountain, Shawn Wright, Josh Kight, Josh Knight, and Carry Grable.

### *International Education and Collaborations in Horticulture*

The Department has supported a Specialist position to promote international collaborations and education from 2013 to date. This program has developed new formal relationships (signed Memoranda of Understandings) between the University of Kentucky and Yezin Agricultural University in Myanmar and between UK and the Federal Rural University of Rio de Janeiro in Brazil. In addition to formal relationships, the program has developed close working relationships with scientists and agricultural universities in Cuba and Yunnan Provence, China.

Specific programs supported through this position included an Education Abroad course in Sustainable Agriculture and Food Security in Cuba (2015) and a Study Tour for Sustainable Agriculture and Education in Cuba (2019); the latter program participants included 18 Extension Specialists and researchers from the Southeast and around the country. The relationship with Yezin Agricultural University has to date resulted in eight visits to YAU in Myanmar by faculty from four UK departments and one visiting faculty scholar visit to UK from YAU. The Specialist has also recruited five summer research interns (2018–2019) and will bring three to the Horticulture Research Farm in 2020.

This program has also participated in the development of solar-powered and other low pressure drip irrigation systems and trials in Myanmar (ongoing), Gujarat, India (2014), and Kunming, China (ongoing). The Specialist also provides drip irrigation training and technical support for local growers and institutions including extension agent training and statewide training for all Kentucky NRCS Agents (2018).

Extension Specialists participating in this program are, Brent Rowell, Rachel Rudolph, and Joshua Knight.

### *Horticulture Training for Elementary Students Program*

A program funded by a UK Sustainability Challenge Grant to encourage the development of youth interest in horticulture in rural Kentucky was conducted with elementary students in Lyon and Caldwell counties in cooperation with Master Gardeners. In 2018 advanced Master Gardener training was provided for over 900 4th and 5th grader students who showed a tremendously positive response to the program.

The Extension Faculty member involved with this program is Winston Dunwell

### *The Center for Crop Diversification (CCD)*

The numerous resources of the Center for Crop Diversification are available on our website (www.uky.edu/CCD/). Over the past three years, that website has been viewed a total of 412,089 times according to Google Analytics. Two Kentucky Specialty Crop Block Grants (2015 and 2016) have enabled the CCD to develop 12 new crop profiles or fact sheets on topics of interest to specialty crop growers, and to update 90 existing crop and marketing profiles. All Horticulture Department Extension Specialists are involved in reviewing and updating the crop profiles. The subscriber list to the CCD's monthly newsletter, which covers topics of interest to specialty crop growers, now exceeds 1,600 readers in Kentucky and throughout the region. In addition to online resources such as fact sheets, enterprise budgets, price reports, podcasts, webinars and videos, CCD staff also disseminate publications at statewide conferences throughout the region, and at county meetings and field days around Kentucky.

The CCD also conducts presentations at the Kentucky Fruit and Vegetable Conference. A "What to Think About Before You Plant" session at the 2017 conference, based on a publication with the same title, was described by a Kentucky Horticulture Extension Agent as the best session he attended at the conference. The CCD also presented two webinars for growers and an agent in-service training webinar on the topic. The CCD's Facebook page featuring new and updated resources (profiles, newsletters, webinars, etc.), received more than 4,000 engagements – combined post likes/reactions, comments and shares – in 2018. The Facebook page, which has more than 1,600 followers, has

received nearly 5,000 total engagements on all posts in 2018. The CCD's price reports are the most-viewed pages on the website, and help growers determine how to price their products. The CCD also hosts farmers market and/or produce auction price reports for Indiana, Illinois and Tennessee.

The CCD is helping Kentucky growers hone their marketing skills through its Marketing for All curriculum (http://www.uky.edu/ccd/marketing-all), which is supported by a 2017 Kentucky Specialty Crop Block Grant. Marketing for All trainings are offered at Extension offices around the state upon request for one or more of the curriculum topics. The CCD also plays a leadership role in SERA-45, a Southern Extension and Research Activity project on crop diversification that involves faculty and staff from nine universities in eight states. The CCD has partnered with the Center for Profitable Agriculture in Tennessee and is developing new publications to benefit growers and Extension personnel in both states. The CCD has used these external funding sources to cover program costs and to pay for partial staff time, improving programs and reducing costs to the college. This further amplifies the return on investment of these programs.

Christy Cassady oversees the CCD project and all Horticulture Extension Faculty, Specialists, and Extension Associates as well as Tim Woods and Brett Wolff in the Ag Economics Department are involved with this program.

## Extension Publications and Educational Resources

**Table 22** provides a summary of publications and educational resources that have been developed by extension personnel in the period under review. A complete listing of these may be found at http://dept.ca.uky.edu/agc/pub_dept.asp?dept=Horticulture.

**Table 22. Summary of Extension Publications and Educational Resources**

| Publications or Educational Resource | Number |
|---|---|
| Fact Sheets | 6 |
| College Extension Publications | 58 |
| Educational Videos | 28 |
| Educational Presentations | 631 |
| Decision Support tools | 0 |
| Electronic Resources (Apps, webinars, USB-based, web based, etc.) | 43 |
| Magazine/Trade/Newspaper articles | 38 |
| Proceedings | 11 |
| Book Chapters | 7 |
| Refereed Journal Articles | 42 |
| Abstracts | 17 |
| Invited Papers | 8 |
| Newsletter Articles | 146 |
| Research Reports | 24 |

## Extension Faculty and Staff Awards and Recognition

Extension faculty and extension associates have received a total of six major awards for their work since 2014. These are listed below and involve national, regional, state and college awards.

- Eastern Region International Plant Propagators' Society Fellow Award (Winston Dunwell, 2015)

- Inaugural Dr. John Strang Award from the Kentucky State Horticultural Society (John G.Strang, 2015)
- SR-ASHS Blue Ribbon Communication Award Winner, IPM for Shrubs in Southeastern US
- Nursery Production: Volume 1. Editors: Sarah A. White and William E. Klingeman; Authors, (Winston Dunwell and members of Southern Nursery IPM Working Group, 2015).
- ASHS Extension Division Education Materials Award, IPM for Shrubs in Southeastern US Nursery Production: Volume 1. Editors: Sarah A. White and William E. Klingeman; Authors, (Winston Dunwell and members of Southern Nursery IPM Working Group, 2015).
- Recognition of Excellence, National Regional Awardee for activities as a member of NC-1186: Water Management and Quality for Ornamental Crop Production and Health., the Association of State Agricultural Experiment Station Directors, (Winston Dunwell, 2017)
- Kentucky Nursery and Landscape Association Hall of Fame, Kentucky Nursery and Landscape Association. Service, Professional, (Winston Dunwell, 2017)
- Outstanding Education Materials Award-PowerPoint, American Society for Horticultural Science Extension Division (Rachel Rudolph and Joshua Knight, 2019)
- Outstanding Education Materials Award-Primary Visual, American Society for Horticultural Science Extension Division (Rachel Rudolph, Krista Jacobsen, Joshua Knight, 2019)
- Commonwealth of Kentucky Honorary Commissioner of Agriculture (John Strang, 2020)

## Extension Accountability Measures

As part of college, state, and federal accountability measures for extension personnel, Horticulture Extension Faculty and Extension Associates are required to document and report the number of days that they are involved in extension programming activities and the number of contacts they make through their programs and activities. For 2014–2020 horticulture extension faculty and staff reported a total of 17,313 days involved in extension programming/activities, and 376,768 total contacts with clientele. A detailed summary of reported days and clientele contacts may be found in Appendix J.

Extension Faculty Staff and Extension Associates are required to submit Success Stories for their major activities and programs. These are provided in Appendix K.

## Major limitations/Challenges/Needs

Horticulture Extension Faculty, Staff, and Extension Associates have maintained a high level of productivity even though there have been substantial challenges. These will need to be addressed in order to maintain current programs and to develop future programs. The following are constraints for extension programming.

Currently departmental extension funds are allocated mostly for faculty and staff salaries. Consequently, funds for extension programming and travel are limiting reach and impact. As a result, there is an increasing emphasis for extension personnel to support extension efforts through outside funding. This emphasis on searching to fund programs skews extension programs into areas where the funding is found as opposed to areas where there is a greater Kentucky extension need. Personnel also spend time writing and searching for funding as opposed to spending the time helping clientele.

Several extension faculty members have been asked to increase their teaching load to cover undergraduate courses because they have expertise in these areas. This has reduced the time for extension programming.  For example, Dr. Durham will need additional help to conduct the Master Gardener program as his teaching load and administrative role as DUS has been increased.

The Horticulture department will soon face a major loss in senior extension faculty due to retirements. One faculty member is on a post-retirement appointment that will end toward the end of 2020. Three other extension faculty will retire within the next two to five years.

# Appendix A

## Program Review Implementation Plan (2013)

# UK Program Review Implementation Plan

*This **required** form is described as Appendix A in AR II-I.0.6.*

**College/Unit: Agriculture Food and Environment/Horticulture** **Date: July 22, 2013**

| Recommendation/ Suggestion | Source I/E/H* | Accept/ Reject** | Unit Response (resulting goal or objective) | Actions (including needed resources) | Time Line |
|---|---|---|---|---|---|
| 1. Communication seems to be difficult from a number of standpoints. People feel out of the loop, and non-faculty (staff, students, etc.) want to be part of the conversation, or at least informed. Listservs, regular faculty meetings, social events, graduate student and staff liaisons at faculty meetings could all be helpful. There is a level of camaraderie that exists on the Horticulture Research Farm (HRF) that appears lacking elsewhere in the department. In addition to internal communications, some focus on external marketing and a stronger web presence for the department and sustainable agriculture program and farm is important. | E | A | The chair and departmental faculty will develop and implement practices that engage a greater number of staff and students in decision-making processes.<br><br>A new web page will be developed for the department where regular faculty meetings will be posted as well as recent news about students, staff, and faculty. | A student and staff representative will be appointed to attend faculty meetings. Additionally, separate meetings between the chair and all staff will be organized.<br><br>A new web page has been developed and launched since the review | 08/01/13<br><br>implemented |
| 2. The department needs to develop a long-term vision and strategic plan that is more specific to its needs and goals. This should be done with meaningful input from staff and students. The focus on sustainability seems broadly accepted, though it was also clear that more definition needs to be put around that concept so the department has some consensus on positions, prioritizing resource needs, and coordinating research and extension effort. | E | A | The department will develop a long-range vision and strategic plan that adds more definition to our focus on sustainable Horticulture. | The department will organize a retreat for all students, staff, and faculty to address this issue | Begin in Fall, 2013 and finish by Fall, 2014 |
| 3. The department and its stakeholders need to develop a long-term vision and strategic plan for the Horticulture Research Farm. The | E | R | As one of the strategies under goal 3 in the existing strategic plan the department committed to position the Horticulture Research Farm (HRF) as a | No action needed | NA |

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|---|---|---|---|---|---|
| farm is an extremely valuable asset for the department and can attract students, funding, and community support for its programs. The strategic plan for the farm should include long term collaborations with other departments. | | | nationally recognized center of excellence<br>for research and education in sustainable/organic production practices and environmentally<br>sustainable infrastructure. Furthermore the department has always had good collaborations with many other departments in the college. | | |
| 4. Broaden the focus of the extension associates to be more nimble with a range of expertise and support that provides leadership to clientele. To be most effective, extension should engage more broadly with local food systems and a range of sustainable agriculture practices. | E | R | The majority of extension associates are on grant funds and have very defined responsibilities according to objectives in the grant which cannot be altered at this time. | No action needed | NA |
| 5. Consider developing a strategy that integrates academic, extension, and research programs in sustainable agriculture with a focus on the HRF. This has potential for fundraising and would bring clearer focus to the vision, mission, and goals for the farm and program. | E | A | The department will work towards developing a long range plan for the HRF aimed at increased visibility and integration of research, teaching, and extension activities | See point 2 above. The department will use the retreat as a platform for moving forward on this objective | Fall, 2013 |
| 6. Sustainable Agriculture should become a degree program. As the program works to become more interdisciplinary, the Steering Committee should work with administration to communicate and agree on goals and direction. | E | R | It is not within the authority of the department to make such a decision about the multidisciplinary Sustainable Agriculture program. Moreover, it is important for the future of SAG that the degree program is not regarded as belonging to Horticulture. | No action needed | NA |
| 7. The department needs to develop a cohesive graduate education experience. Students expressed a need for informational seminars and the desire to know more about what other faculty are doing and how the work of their labs relate to the work of the department as a whole. Specific recommendations include the following:<br>• Develop formal teaching or extension experiences, depending on students' interests, as an integral part of the education of graduate | E | A | The departmental seminar series will be used as an outlet to provide training sessions for graduate students on grant writing and budget development as well as teaching and extension learning opportunities.<br><br>The department has a competitive pool of funds available for graduate students and they will be made more aware of this resource.<br><br>There is an opportunity for the graduate students to become part of a larger | Topics will include:<br><br>How to publish a paper<br><br>Regardless of data or discipline, what are you trying to do and what story are you trying to tell?<br><br>The anatomy of a research proposal to NIFA, DOE, NSF, etc., and its essential components such as the budget and its justification<br><br>Setting up a lab | Fall, 2013 |

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| students in the Horticulture Department.<br>• Develop a competitive pool of funding for graduate students to attend scientific meetings. This funding would benefit students and allow the department to have a greater presence at conferences.<br>• Work to create more professional and social interaction through organized departmental activities for faculty and students as well as encouraging students to organize as a group.<br>• Develop a seminar or short classes that focus on grant writing activities, cross-training on equipment and techniques, and other subjects that would assist graduate students in their career preparation. | | | interdisciplinary graduate student body through the IPSS program. However, faculty will work to identify and create opportunities for more social interactions with students and among faculty. | University resources to help you get ahead.<br><br>See point 2 above. A retreat will be used to initiate discussions on how best to address this recommendation. | |
| 8. Increase the departmental budget. | I | R | It is not within the means of the department to increase our recurring state or federal budgets. However, departmental faculty can advocate for increased budgets. | No action needed | NA |
| 9. Leverage existing tobacco settlement funds towards identifying and securing sustainable long-term funding for essential extension related programs. | I | A | The existing programs that utilize tobacco settlement funds all have goals and objectives designed to enhance and secure future sustainable funding mechanisms. Several positions within these programs have been moved onto permanent funding sources through a combination of departmental and higher administration efforts in recognition of their outstanding performance. | The department will continue to identify mechanisms and opportunities to provide sustainable funding mechanisms for these programs. | ongoing |
| 10. Identify under-utilized office and laboratory space in the Plant Science building and lobby administration to move a significant portion (if not all) of the Horticulture Department. | I | A | Underutilized or inefficiently allocated space will be identified and brought to the attention of college administration. | The chair will routinely canvas the existing allocations of basic laboratory and office space in the Plant Science Building and discuss with college administration. | ongoing |
| 11. Develop a staged master plan for the HRF that will culminate with the completion of farm security, communication upgrades, management policies, and the development of new water | I | A | This has been a departmental goal during this year and has recently been completed | No action needed | NA |

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| resources. | | | | | |
| 12. Catalyze the creation of new opportunities to provide modern office and laboratory space for all members in the department. | H | A | See #10 above | See #10 above | ongoing |
| 13. Find ways to provide stable recurring funding for extension associates. | H | A | The department will continue to work with college administration to find ways to move extension associates into permanently-funded positions. | With recent budget cuts this has been difficult but through a combination of college and departmental support at least two associates are now in permanent positions. | ongoing |
| 14. Identify a funding source for the Crop Diversification & Biofuel Research & Education Center. | H | A | Funding has been secured for one year for the Crop Diversification Center from the Kentucky Agricultural Development Board. An additional proposal is pending with the USDA/AFRI program for continuing funds | Future efforts will be devoted to exploring the possibility of developing a multi-state regional project for the Crop Diversification Center. | ongoing |
| 15. Continue efforts to transform the HRF into a nationally recognized center for sustainable horticulture. | H | A | Efforts to improve HRF operations and efficiency are on-going but difficult with the current budget situation. | The immediate focus is to recruit and hire a new farm superintendent and establish a budget for the HRF. | Fall, 2013 |
| 16. Identify mechanisms to fill existing vacant faculty positions and, moreover, ways to increase the number of faculty lines in the department. | H | A | The department will strive to identify essential positions and funding sources to fill at least two positions over the next five years. | The department will explore the possibility of partnering with other units within the college to create opportunities to fill positions. | Fall, 2013 to Fall, 2018 |
| 17. Identify and implement a solution to the declining enrollment in the Horticulture and Plant Science undergraduate program. | H | A | The department will pursue two routes to increase undergraduate enrollment.<br>1) Implement new courses that attract more students and<br>2) Utilize the newly hired academic recruiter in Plant and Soil Science to assist with recruiting Horticulture students. | The department has reinstated a floral design course which has significantly increased the visibility of the department with large increases in enrollment. A second advanced floral design class has also been developed. Both of these classes satisfy new General Education requirements on campus and are proving to be very attractive to undergraduate students across the entire campus.<br>The department is also developing and launching three new courses: Fermentation technology, Viticulture, and Enology.<br>Arrangements will be made with the new academic recruiter to assist with Horticulture undergraduate student recruiting. | Ongoing and Fall, 2013, Spring, 2014, and Fall, 2014 |

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| 18. Identify mechanisms to reward outstanding faculty and staff. | H | A | Over the next year the department will identify ways to recognize and reward outstanding faculty and staff. | The department will explore the possibility of setting up a specific fund and/or program that will accomplish this objective. | Fall, 2013 to Fall, 2014 |

* **Source of Recommendation (I = Internal recommendation; E = External Review Committee recommendation; H = Unit Head recommendation)**
** **Accept/Reject Recommendation (A=Accept; R=Reject)**

**Unit Head Signature:** _____ **Unit Head Supervisor Signature:** _____ **Date:** _____

# Appendix B

## Arboretum Action Plan Committee Report (2019)

## The Arboretum State Botanical Garden of Kentucky

# 2019 Action Plan Committee Report

### October 25, 2019


The Arboretum
State Botanical Garden of Kentucky
UNIVERSITY OF KENTUCKY AND LEXINGTON FAYETTE URBAN COUNTY GOVERNMENT

University of Kentucky
College of Agriculture, Food and Environment

## Executive Summary

In 2018, the Dean of the College of Agriculture, Food and Environment (CAFE) initiated a review of The Arboretum. This review, led by Dr. Vanessa Jackson, Chair of the Department of Retailing & Tourism Management, culminated in a report released in January 2019.

Based on the 2019 report, the Dean charged an Action Plan (AP) Committee to determine strategies that will guide The Arboretum's future over the next five-six years as a university, community and state-wide resource, with the expectation that the AP Committee would make recommendations from diverse perspectives from both inside and external to the University. The AP Committee was formulated in the summer of 2019 and was chaired by Dr. Lisa Collins, Associate Dean in CAFE, with CAFE Director of Assessment Tricia Coakley as project manager. The AP Committee consisted of thoughtful leaders from the Lexington-Fayette Urban County Government, the Friends of The Arboretum, and the University of Kentucky. Members of the AP Committee are listed on page 2 of this document.

This Action Plan is now the basis for The Arboretum's strategic initiatives through 2024, with The Arboretum director and the chair of the Department of Horticulture charged to develop an annual report that will be issued by October each year for the prior fiscal year.

This Plan consists of six overarching recommendations, each with enabling strategies that start on page 3 of this report:

1. Evaluate and refine the role of each area of the vibrant leadership coalition, including the director, department chair, Advisory Board, Friends of The Arboretum, the college, and the university.

2. Continue to engage LFUCG leadership in strategic planning and discussions to enhance the UK partnership with local government.

3. Create new business and philanthropic opportunities through development of a business plan and comprehensive fundraising strategy.

4. Prioritize renovation and expansion of the existing Dorotha Smith Oatts Visitor Center at The Arboretum. Continue to update facilities and develop assessment tools for equipment and space quality and utilization (gift shop, meeting space, classroom space).

5. Continue existing and create additional professional development opportunities for staff and director.

6. Develop a process to work with faculty and students to enhance utilization of The Arboretum, to be more fully aligned with the university's land-grant mission of teaching, research, and extension.

# 2019 Arboretum Action Plan Committee Members

| Name | Association |
|---|---|
| Dr. Lisa Collins (Committee Chair) | CAFE Associate Dean |
| Dr. Mark Williams | Horticulture Department Chair |
| Mayor Linda Gorton | LFUCG |
| Molly Davis | Arboretum Director |
| Dr. Orlando Chambers | CAFE Associate Dean |
| Professor Ned Crankshaw | Landscape Architecture Department Chair & Arboretum Advisory Board |
| Susan Campbell | CAFE Director of Finance |
| Elizabeth Vaughn | CAFE Philanthropy |
| Dr. Dewayne Ingram | Horticulture Department faculty & Arboretum Advisory Board |
| Dr. Rob Paratley | Department of Forestry and Natural Resources faculty & Arboretum Advisory Board |
| Dr. Scott Smith | immediate past CAFE Dean, Friends of The Arboretum Board member |
| Susan Lamb | LFUCG City Council Member & Arboretum Advisory Board |
| Monica Jones Conrad | LFUCG Parks & Recreation |
| Don Crawford | UK Physical Plant Division, Grounds Keeping |
| Stacy Borden | UK Arborist |
| Nancy McNally | Friends of The Arboretum Board President & Arboretum Advisory Board |
| Dawn Bazner | Friends of The Arboretum Board Vice President |
| Tricia Coakley | CAFE staff, Strategic Planning and Assessment |

## 2019 Action Plan

### Recommendation 1: Evaluate and refine the role of each area of the vibrant leadership coalition, including the director, department chair, Advisory Board, Friends of The Arboretum, the college, and the university.

**1. A.** We recommend the February 5, 2014 Revision of Organization and Operating Procedures for The Arboretum, State Botanical Garden of Kentucky be revised to:

1.A.1. Reflect the current college and university administrative structure. The Arboretum director reports to the Chair of the Department of Horticulture who, in turn, reports to the Dean of CAFE.

1.A.2. Reflect that the role and purpose of The Arboretum's Advisory Board is to advise the Chair of the Department of Horticulture and the Director of The Arboretum.

1.A.3. Include that future Advisory Board appointments by both partners incorporate input from the Advisory Board to strengthen Board effectiveness. (crosswalk with 2.F.)

1.A.4. Include that regular Advisory Board meetings occur four times a year (March, June, September and December) to provide more in-depth discussion. Special meetings may be scheduled as needed.

1.A.5. Establish term limits for UK representatives (possibly to match LFUCG term limits), board composition guidelines, and onboarding process for Advisory Board.

1.A.6. The Arboretum will keep track of Advisory Board terms of UK representatives so at the appropriate times the Dean of CAFE can write a letter to the UK President requesting new or reappointed members.

**1. B.** We recommend that the Advisory Board review progress and plans in the following areas and make recommendations where appropriate:

1.B.1. Establishing The Arboretum's budget priorities

1.B.2. Periodic strategic planning

1.B.3. Fundraising

1.B.4. Development of additional resources from grants, public appropriations and income

1.B.5 Educational programming, research and outreach efforts for and at The Arboretum

1.B.6. Design, planning and establishment of new or proposed buildings, structures, gardens or horticultural/landscape features.

1.B.7. Updates on progress will be made at every Advisory Board meeting

**1.C.** The Subcommittee is supportive of the motions made and passed at the Friends of The Arboretum (FOA) Board of Directors (BOD) July 17, 2019 meeting.

1.C.1. A motion was made and approved to change terminology from “member/membership” to “Friend(s) of The Arboretum” with the additional clarification that this will apply to all individuals making a qualified gift to The Arboretum.

1.C.1. A second motion was made and approved to suspend the operations of the FOA BOD pending the implementation of a Transition Committee to be appointed by Mark Williams.

**1. D.** We recommend that succinct vision, mission and values statements be updated and/or developed as part of the strategic planning effort. Staff and stakeholders shall have extensive input into this process.

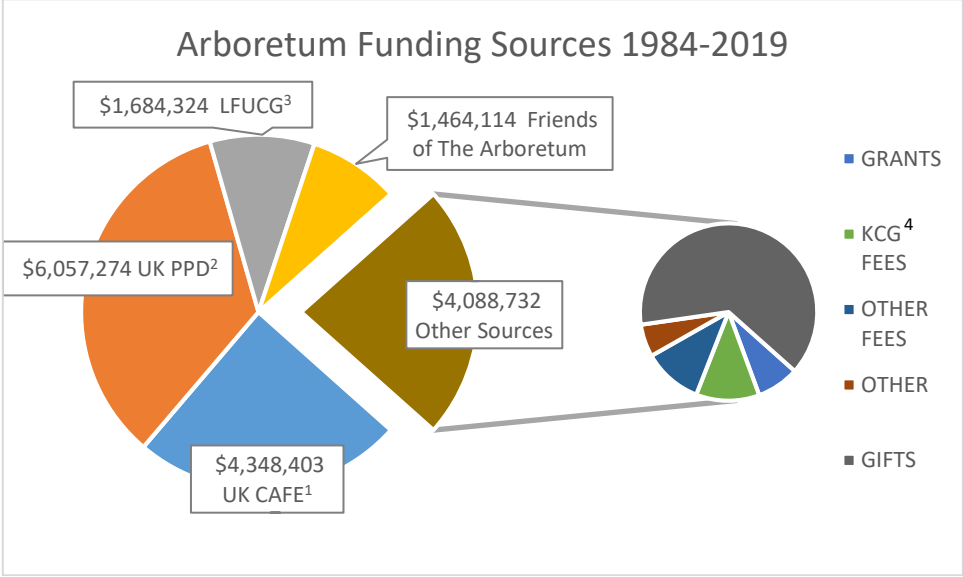
## Recommendation 2: Continue to engage LFUCG leadership in strategic planning and discussions to enhance the UK partnership with local government.

Continue to engage LFUCG leadership in strategic planning and discussions to strengthen further the UK – LFUCG partnership.

The Arboretum was created through a partnership of the University of Kentucky and the Lexington Fayette Urban County Government. Throughout its existence it has received essential funding and support from both partners. If The Arboretum is to continue building excellence of programs and facilities, this partnership must be sustained and strengthened.

The subcommittee (Mayor Gorton, Council Member Susan Lamb, Arboretum administrator Mark Williams, Dewayne Ingram, Beth Vaughan, and Scott Smith attending) met on June 11, 2019 in the Mayor’s Office to discuss recommendations and strategies for achieving this goal. This recommendation and those that follow arose from a thoughtful and fruitful conversation related primarily to the LFUCG partnership with the Arboretum.

**2. A.** The history of funding by LFUCG and UK should be documented and included in the Action Plan Committee’s report. See Appendix A for additional information.




1. UK College of Agriculture, Food and Environment
2. UK Physical Plant Division
3. Lexington-Fayette Urban County Government
4. Kentucky Children’s Garden

The Arboretum funding history from all sources is provided in a separate file. This record demonstrates that both LFUCG and UK have made substantial investment in The Arboretum on a continuing basis throughout more than three decades. The LFUCG investments have been predominantly in support of projects, facilities and programs while the UK investment has supported a base budget of recurring and operating funds. Thus, the budgeting process and the types of support have differed for UK and LFUCG, and are likely to differ in the future. However, both partners have been and will continue to be essential to the development of The Arboretum. Undoubtedly, future advancement is dependent on continuing growth of support and investment from multiple sources.

**2. B.** In the near future, opportunities for additional support from LFUCG are most likely to be in the form of grant programs and non-recurring collaborative agreements. These opportunities should be evaluated and actively pursued by Arboretum staff, LFUCG partners and other collaborators.

The subcommittee did not directly discuss the possibilities for recurring operating funding for The Arboretum from LFUCG, although this issue was raised in preliminary Committee surveys. Any such discussions should occur among UK and LFUCG leadership.

**2. C.** Arboretum leadership and advisors should compile a "needs list" of appropriate opportunities for LFUCG funding, revise this annually, and share with LFUCG leadership.

Examples, which could be appropriate targets for LFUCG investment, include:

2. C. 1. Expansion of the parking lot as a demonstration, education project of pervious paving.

2. C. 2. Storm water or water quality community education programs.

2. C. 3. Plantings or landscaping which demonstrates and supports public education about environmental or resource issues, analogous to the KU street tree planting.

2. C. 4. A shared environmental education staff position (as was jointly funded by the partners in the past).

**2. D.** The Arboretum should collaborate with Cooperative Extension, Parks and Recreation, Urban Forestry, non-profits and other appropriate organizations to make Arbor Day at The Arboretum even more of a major annual event.

Although the suggestion was made in preliminary Committee discussions, the subcommittee agrees that there would be limited interest in increasing the number of partnership events at The Arboretum, and benefits would be minimal. Additional partnership events are not recommended at this time.

The subcommittee believes that one annual high visibility event involving a community-wide partnership would best advance the LFUCG partnership with The Arboretum.

**2. E.** While the current partnership with Parks and Recreation has been fruitful and positive, future opportunities for growth of the LFUCG partnership may be found with other local government entities, including Urban Forestry, Environmental Services and the Environmental Commission. We recommend that stronger linkages with staff and programs in these units be developed.

**2. F.** We recommend that future Advisory Board appointments by both partners become more intentional in order to strengthen Board effectiveness in guiding Arboretum planning and programs. This could be accomplished in part through more communication among leadership of The Arboretum, CAFE, LFUCG, and current Board members when making future Board appointments.

Representation and engagement of the UK and LFUCG partners may be strengthened through an even more active, informed, representative Advisory Board, including members from key areas such as VisitLex. (crosswalk with 1.A.3.)

**2. G.** Limited knowledge of The Arboretum, locally and beyond, significantly constrains community perception of The Arboretum as a substantial asset. To sustain progress toward The Arboretum goal - becoming a nationally and internationally recognized botanical garden and therefore an elite community asset - we recommend additional efforts to promote community awareness.

Simple examples might include:

2. G. 1. Attractive brochures or informational material available at VisitLex and other regional visitor centers

2. G. 2. Better cross links on LFUCG and Arboretum web sites and social media

2. G. 3. Increased interstate and local wayfinding signs

2. G. 4. Annual presentations to the LFUCG Council about The Arboretum

2. G. 5. Hosting Council and other LFUCG leadership at The Arboretum for a reception scheduled close to Arbor Day celebrations.

## Recommendation 3: Create new business and philanthropic opportunities through development of a business plan and comprehensive fundraising strategy.

**3. A.** Review naming/giving levels across The Arboretum to ensure congruency with University guidelines

3. A. 1. Develop new list of naming/giving levels

**3. B.** Develop comprehensive fundraising plan for five years, with yearly action items that includes annual fund, capital gifts, major gifts, cultivation, stewardship, etc. in conjunction with CAFE Philanthropy staff

3. B. 1. Work with UK Graduate students in health care to determine opportunities for grants to cover new areas

3. B. 2. Plan should include all projects and endowment opportunities within The Arboretum

3. B. 3. Investigate new giving options such as text-to-give

3. B. 4. Investigate options for promoting payroll deductions among UK faculty and staff to support The Arboretum

**3. C.** Rewrite the case statement for fundraising for The Arboretum

3. C. 1. Work with Martin School to conduct economic and functional impact study to help rewrite statement

3. C. 1. Statement should clearly articulate impact of gifts on larger community through The Arboretum

**3. D.** Document year-round staffing needs for Arboretum indoor and outdoor staff, include cost projection of positions

**3. E.** Review and recommend a revised membership/Friends structure and donor recognition

3. E. 1. Consider rates for Friends recognition levels

3. E. 2. Recommend benefits to donors for giving levels

**3. F.** Investigate options to work with UK Healthcare, UK HR, UK student activities and other UK areas to help support existing programs at The Arboretum

**3. G.** Analyze entry fee for Kentucky Children's Garden and review daily passes and annual pass rates

**3. H.** Expand existing foot race policy to become event policy, make recommendations for fees to be charged for renting space, incorporate UK event policies

**3. I.** Create an Education Funding Plan that is part of business plan, but robust enough to stand alone and work with the college business center to assess cost of staffing and programs

**3. J.** Investigate existing 501(c)(3) option within Bluegrass Community Foundation and as a stand-alone entity that would be acceptable within UK policy

3. J. 1. Review structure of Markey, UK Women's Club, UK Alumni Association, CAFE Alumni Association and 4-H Foundations to determine best practices

3. J. 2. Review and recommend how the 501(c)(3) would work without Friends Board/Committee Structure

3. J. 3. Consult with legal counsel within the college to determine advantages and challenges of establishing 501(c)(3)

**3. K.** Develop cost benefit analysis of fencing entire Arboretum or fencing portion of Arboretum and make recommendation on which would have higher return on investment

3. K. 1. Review swipe card systems to allow members/neighbors to access through fence in neighborhoods surrounding Arboretum

3. K. 2. Review how Flight 5191 Memorial access would be impacted with fencing and make recommendations regarding family visitations

3. K. 3. Review budgetary requirements for changing exhibits within a fenced area to draw return visits

**3. L.** Develop a long-term business plan (10 years minimum) and a short-term business plan (5 years) that ties to strategic and master plans for The Arboretum and includes a site assessment of grounds areas and functions.

3. L. 1. Utilize CEDIK, SBDC and college resources to assist with plan

3. L. 2. Consider using MBA students to assist with plan

**3. M.** Develop a more robust gift shop in new visitors center building

**3. N.** Investigate viability and strategies for implementing a parking fee

**3. O.** Investigate feasibility of UK and/or LexTran putting The Arboretum on the bus route so that more area residents have a means to visit The Arboretum. Investigate feasibility of the Medical Center and/or the Ronald McDonald House providing a shuttle to and from The Arboretum so patients and families of patients have a means to visit The Arboretum.

### Recommendation 4: Prioritize renovation and expansion of the existing Dorotha Smith Oatts Visitor Center at The Arboretum. Continue to update facilities and develop assessment tools for equipment and space quality and utilization (gift shop, meeting space, classroom space).

**4. A.** Collect data on utilization of space to identify bottlenecks and opportunities for expansion with a goal to establish a world class Arboretum.

**4. B.** Visit peer institutions to gage current Arboretum resources and to help identify future needs.

**4. C.** Inventory Arboretum plant collections, equipment, and space.

**4. D.** Develop and implement a new design for The Arboretum Visitors Center. This process should be inclusive and transparent, and involve a thorough assessment of current and future space needs, including increased utilization as an event space.

**4. E.** Develop and implement a design for a Ground Crew facility that facilitates increased management capacity of the plant collections.

### Recommendation 5: Continue existing and create additional professional development opportunities for staff and director.

**5. A.** Report on continuing education in which Arboretum staff have participated (2014 to 2019).

**5. B.** Identify internal and external professional development (PD) opportunities for all Arboretum staff, including director. Support at least one PD engagement per staff member each year (including college support or grant funding, when applicable).

Examples of some UK and CAFE opportunities are:

- CAFE Business Center professional development resources website:
    - https://cafebusinesscenter.ca.uky.edu/files/staff_professional_development_opportunities.pdf
- UK HR Training and Development programs/courses:
    - http://www.uky.edu/hr/training
- UK Employee Education Program:
    - http://administration.ca.uky.edu/content/employee-education-program-cafe
- CAFE staff mentoring program:
    - https://cafebusinesscenter.ca.uky.edu/files/mentor_program_-_web_site_wording.pdf
- CAFE staff online orientation course
- CAFE supervision online orientation course (coming soon)

- CAFE Staff Professional Development Fund:
  - https://cafebusinesscenter.ca.uky.edu/files/staff_professional_development_fund_-_testimonials.pdf
- UK Environmental Health and Safety classes:
  - http://ehs.uky.edu/classes/
- College Business Management Institute (CBMI):
  - https://www.sacubo.org/Professional%20Development/CBMI

**5. C.** Collaborate with Physical Plant Division (PPD) supervisor Stacy Borden to identify PD opportunities for PPD staff assigned to The Arboretum and provide these opportunities.

**5. D.** In collaboration with PPD, determine a way for Arboretum staff to learn how to apply for admission to UK and register and take courses aligned with The Arboretum's mission under the UK Employee Education Program (EEP) at appropriate times of day. IF EEP opportunities are not available to all Arboretum staff, provide a rationale.

**5. E.** Determine the feasibility of fundraising for a PD fund for Arboretum staff.

**5. F.** Seek someone from UK HR or a local trainer who can provide guest services training and team building activities to Arboretum personnel in order that they have the ability to provide outstanding guest services fitting for a public garden.

**5. G.** Seek advice from UK HR on ongoing mentoring and performance feedback on a more regular basis than an annual performance review.

### Recommendation 6: Develop a process to work with faculty and students to enhance utilization of The Arboretum, to be more fully aligned with the university's land-grant mission of teaching, research, and extension.

**6. A.** Action Plan Recommendation Connected to All Three Mission Areas: Develop and publish a publicity brochure highlighting faculty, student, and extension opportunities for use of The Arboretum. Provide the brochure through New Faculty Orientation, Faculty Council, Student Tours, New Extension Agent Orientation, and County Extension Offices.

**6. B.** Teaching and Learning: Take actions to increase educational use of The Arboretum in intensive ways and in a broad spectrum of more occasional interactions.

> 6. B. 1. Explore opportunities within the CAFE Horticulture program curriculum to create a public gardens certificate or emphasis area using The Arboretum as a host for high impact practices in education. Consider collaboration with the CAFE Department of Community and Leadership Development for non-profit management, the CAFE Department of Landscape Architecture for design, and Public Health or Behavioral Medicine units for the health benefits of contact with nature.
>
> 6. B. 2. Communicate with faculty members in specific departments to encourage greater use of The Arboretum by courses in plant identification, planting design, soil science, ecology and evolutionary biology or others that could benefit from The Arboretum as a learning venue.
>
> 6. B. 3 Publicize the opportunity for faculty members university-wide to use The Arboretum as a venue for experiential learning on The Arboretum website, through contact with the Center for Enhancement of Learning and Teaching and other institutional education coordinators, and in venues such as UKnow.

6. B. 4. Develop plans for sharing information about The Arboretum with incoming UK undergraduate students, possibly involving K-week, UK 101, See Blue orientation days, and others.

**6. C.** Extension Education: Develop the capacity for The Arboretum to serve as a venue for Extension programming related to environment and sustainability, horticulture, landscape architecture, nutrition connected to gardening, horticultural therapy/stress reduction, and other interest areas.

6. C. 1. Ensure that design and construction of the Visitor Center addition results in indoor and outdoor space that facilitates extension education programming. When facilities are in place, communicate with Extension faculty and specialists in CAFE to encourage use of The Arboretum as a venue for programming.

6. C. 2. Continue developing interpretation at The Arboretum to convey knowledge about environmental benefits of native plants, horticultural practices, environmental sustainability, and landscape design to a general audience.

**6. D.** Research: Communicate with faculty and staff at UK and other institutions/organizations about the availability of The Arboretum as a venue for research and demonstration projects.

6. D. 1. Create concise synopses of research projects conducted at The Arboretum over a multi-year period and highlight the description on The Arboretum website.

6. D. 2. Work with CAFE Research Office to track annual totals for grants and publications supported by The Arboretum facilities.

6. D. 3. Working with UK Foundations Philanthropy, identify potential faculty collaborations to seek research funding specific to public gardens projects.

6. D. 4. Develop a seminar presentation highlighting the historical importance of Botanical Gardens and a spotlight on the potential of our own Arboretum to increase awareness in UK units of potential interest.

6. D. 5. Investigate grant opportunities for joint application with LFUCG.

6. D. 6. Investigate feasibility of UK and/or LexTran putting the Arboretum on the bus route so that more area residents have a means to visit the Arboretum. Investigate feasibility of the Medical Center and/or the Ronald McDonald House providing a shuttle to and from the Arboretum so patients and families of patients have a means to visit the Arboretum.

6. D. 7. Determine with the chair of the Department of Horticulture and the Dean of CAFE the feasibility of adding a new faculty or staff line that focuses on research and education at The Arboretum.

# Appendix A
# ARBORETUM FUNDING BY SOURCE

| | | | | | | INCOME (NOTE 6) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **FISCAL YEAR** | **COLLEGE (NOTE 2)** | **PPD (NOTE 3)** | **LFUCG (NOTE 4)** | **FRIENDS (NOTE 5)** | **GRANTS** | **KCG FEES** | **OTHER FEES** | **OTHER** | **GIFTS** | **FY TOTAL** |
| 1984-6 | $ 40,000 | | $ 540,000 | | $ 15,000 | | | | | **$ 595,000** |
| 1987 | $ 25,000 | | $ 15,000 | | | | | | | **$ 40,000** |
| 1991 | | $ 4,287 | | | | | | | | **$ 4,287** |
| 1992 | | $ 13,396 | | | | | | | | **$ 13,396** |
| **(NOTE 7)** 1993 | | $ 20,748 | $ 8,000 | $ 3,891 | | | | | | **$ 32,639** |
| 1994 | | $ 59,403 | | $ 3,006 | $ 10,000 | | | | | **$ 72,409** |
| 1995 | | $ 87,539 | | $ 13,068 | $ 18,500 | | | | | **$ 119,107** |
| 1996 | | $ 55,054 | | $ 22,071 | $ 3,500 | | | | | **$ 80,625** |
| 1997 | | $ 83,608 | $ 5,000 | $ 14,305 | $ 10,000 | | | | | **$ 112,913** |
| 1998 | $ 28,650 | $ 106,135 | $ 2,700 | $ 25,502 | $ 7,000 | | | | | **$ 169,987** |
| 1999 | $ 35,262 | $ 88,660 | $ 2,700 | $ 7,004 | $ 7,500 | | | | | **$ 141,126** |
| 2000 | $ 42,885 | $ 192,816 | N7 (paving) | $ 12,841 | $ 2,500 | | | | | **$ 251,042** |
| 2001 | $ 48,107 | $ 222,051 | | $ 35,808 | $ 16,500 | | | | | **$ 322,466** |
| 2002 | $ 88,120 | $ 211,744 | $ 50,000 | $ 500,567 | $ 22,500 | | | | | **$ 872,931** |
| 2003 | $ 97,414 | $ 211,515 | N7 (paving) | $ 22,288 | $ 35,000 | | | | | **$ 366,217** |
| 2004 | $ 107,201 | $ 245,935 | $ 550 | $ 157,697 | $ 20,000 | | | | | **$ 531,383** |
| 2005 | $ 170,538 | | $ 13,374 | | $ 15,000 | | $ 9,600 | $ 50,000 | | **$ 258,512** |
| 2006 | $ 222,579 | $ 362,368 | $ 25,000 | $ 114,254 | $ 44,300 | | $ 13,978 | $ 50,000 | | **$ 832,479** |
| 2007 | $ 247,417 | $ 365,315 | $ 525,000 | $ 29,419 | $ 57,300 | | $ 18,568 | | | **$ 1,243,019** |
| 2008 | $ 259,207 | $ 309,600 | $ 25,000 | $ 99,261 | $ 18,200 | | $ 28,296 | | $ 2,800 | **$ 742,364** |
| 2009 | $ 263,396 | $ 282,525 | $ 25,000 | $ 60,660 | | | $ 17,597 | | $ 50,000 | **$ 699,178** |
| **(N7)** 2010 | $ 292,986 | $ 308,250 | $ 125,000 | $ 58,077 | $ 9,992 | | $ 16,349 | | $ 465,539 | **$ 1,276,193** |
| **NOTE 1** | | | | | | | | | | |
| 2011 | $ 214,639 | $ 316,665 | $ 50,000 | $ 33,843 | | $ 9,072 | $ 32,084 | $ 69 | $ 147,019 | **$ 803,391** |
| 2012 | $ 225,047 | $ 344,667 | | $ 36,282 | | $ 50,566 | $ 47,046 | $ 81 | $ 216,325 | **$ 920,014** |
| 2013 | $ 216,545 | $ 256,941 | $ 125,000 | $ 34,251 | | $ 43,304 | $ 88,822 | $ 112 | $ 101,979 | **$ 866,954** |
| 2014 | $ 265,432 | $ 317,851 | $ 50,000 | $ 44,381 | | $ 51,763 | $ 12,006 | $ 4,235 | $ 187,609 | **$ 933,277** |
| 2015 | $ 267,481 | $ 317,025 | $ 50,000 | $ 33,241 | | $ 62,151 | $ 64,647 | $ 5,818 | $ 178,099 | **$ 978,462** |
| 2016 | $ 290,778 | $ 320,990 | $ 32,000 | $ 28,655 | | $ 71,737 | $ 27,087 | $ 32,440 | $ 200,811 | **$ 1,004,498** |
| 2017 | $ 274,182 | $ 346,826 | $ 15,000 | $ 28,958 | $ 3,066 | $ 63,700 | $ 22,257 | $ 33,178 | $ 582,249 | **$ 1,369,416** |
| 2018 | $ 285,682 | $ 299,423 | | $ 23,425 | $ 2,700 | $ 66,645 | $ 23,203 | $ 33,905 | $ 172,531 | **$ 907,514** |
| 2019 | $ 339,855 | $ 305,937 | | $ 21,359 | | $ 53,843 | $ 21,641 | $ 32,882 | $ 306,531 | **$ 1,082,048** |
| | | | | | | | | | | |
| **TOTAL** | **$ 4,348,403** | **$ 6,057,274** | **$ 1,684,324** | **$ 1,464,114** | **$ 318,558** | **$ 472,781** | **$ 443,181** | **$ 242,720** | **$ 2,611,492** | **$ 17,642,847** |

**Notes**

1- Budget data prior to 2011 were taken from a report compiled by Marcia Farris. Data starting in 2011 were provided by CAFE Business Office.
Multiple changes in account structure and budgeting practices were implemented around this time, not all data are comparable across years.

2- Since The Arboretum was administratively moved to the college, these funds make up The Arboretum's primary operating account.
This account funds most of the full-time Arboretum staff.
Any in-kind contributions provided by the college (i.e., faculty or staff labor, facilities maintenance, event support, etc.) beginning in 1984 are not included in these annual resource totals.

3- These numbers are the value of labor/services contributed by UK Physical Plant Division, calculated at their standard billing rates.
Physical Plant Division does not transfer these funds to The Arboretum budget.
Two staff positions in the PPD budget are assigned primarily to The Arboretum.

4- LFUCG funds are transferred to The Arboretum primarily as grants or agreements for programs, educational services, or capital projects.
Not included are LFUCG costs for contributed services, e.g., paving.

5- Friends funding prior to 2011 is not comparable to after 2011. Budgeting and accounts management changed significantly around this time..
A significant fraction of pre-2011 Friends funding is comparable to what would now be received as gifts.

6- KCG is Kentucky Children's Garden. Other fees are predominantly from classes and events not associated with KCG.
"Other" income includes a KY appropriation in 2005 & 2006, endowment income starting 2011,
and a parking agreement with Athletics starting 2016.

7- LFUCG funding includes some funds not directly transferred to The Arboretum:
$8,000 in 1992 for WAKY design, $4,000 of this was reimbursed to LFUCG by UK
$100,000 of the amount in 2010 for 5191 Memorial, source of these funds was Transportation Cabinet
It is not known whether Marcia Farris included this or any other funding for the memorial in the gifts accounting at the time.
Significant paving contributions by LFUCG in 2000 and 2003 are listed although no monetary value is available.

Significant paving contributions by Lexington Fayette Urban County Government in 2000 and 2003 are listed although no monetary value is available.
LFUCG has supported The Arboretum with additional in-kind contributions.

# Appendix C

## Departmental Rules of Procedure

RULES OF PROCEDURE
Department of Horticulture
College of Agriculture, Food and Environment
University of Kentucky

These Rules of Procedure are intended to be consistent with the Governing Regulations and the Administrative Regulations of the University of Kentucky and the laws of the Commonwealth of Kentucky and of the United States of America. In the event that these Rules of Procedure are inconsistent or contrary to the above-mentioned regulations and laws, then those regulations and laws control.

These rules are not effective unless approved as indicated by the signatures below and posted to the University Senate website. Modifications of these rules must also be approved before modifications take effect. A current copy of the approved rules is available in the Office of the Chair of the department and the Office of the Dean, as well as posted on the University Senate website.

5/25/2019
Date approved by Departmental Faculty

4/30/2019
Dr. Mark Williams, Chair — Date
Department of Horticulture

Nancy M. Cox, Dean — Date
College of Agriculture, Food and Environment

**RULES OF PROCEDURE**
Department of Horticulture
College of Agriculture, Food and Environment
University of Kentucky

## I. ORGANIZATIONAL STRUCTURE

ADMINISTRATION

The Chair has administrative responsibility for implementing the department's program within the limits established by the Governing Regulations and Administrative Regulations of the university, policies of the University Senate, and the rules of the College of Agriculture, Food and Environment. The Chair shall preside over faculty meetings except where the Chair may delegate this function, and shall be an ex-officio member of all departmental committees. The Chair develops the budget, submits it to the Dean of the College of Agriculture, Food and Environment, and administers the budget after its approval. The Chair is responsible for faculty and staff performance evaluations and recommendations on salaries and salary changes. The Chair speaks for the department to higher administration. In the event that the opinion of the Chair differs from that of the departmental faculty, the Chair shall outline his or her differences to the faculty and then communicate the faculty opinion as well as the Chair's opinion to the Dean, stating reasons for differing from the faculty opinion, and notifying the faculty of such action.

FACULTY AND ITS ROLE

The faculty consists of tenured and untenured full-time Assistant Professors, Lecturers, Associate Professors, and Professors, all with voting privileges, and Adjunct Faculty, who do not have voting privileges. The above faculty may extend voting privileges to other departmental individuals and Adjunct Faculty upon 2/3 faculty approval. This will be addressed when departmental individuals and Adjunct Faculty are first appointed. The departmental faculty has jurisdiction over matters concerning its internal policies, insofar as these do not conflict with other departments or with rules of the University of Kentucky Senate and Governing and Administrative Regulations.

### A. Committee Structure

Many routine administrative and policymaking functions are delegated initially to departmental committees, which normally are comprised of faculty members, and staff and student members, where appropriate. Presently, the department has five standing

committees. Volunteers for standing committees are solicited by the Chair, and the Chair will appoint committees in consultation with the Advisory Committee as needed.

All members of standing committees, including staff and students, are voting members of the committees. Committee appointments will normally be for two-year terms, except for student members who serve one-year terms. Committee members may be reappointed to the same committees, following the volunteer and appointment protocols. Recommendations from committees are not binding and must receive a majority vote at faculty meetings for action to be taken. Exceptions to this are decisions made by the Graduate Studies Committee regarding admission of new graduate students and awards of scholarships by the Undergraduate Education and Scholarship Committee. Ad hoc committees may be appointed by the Chair.

**Standing Committees**

**Departmental Advisory Committee** is chosen by the Chair and shall include faculty with primary Research, Teaching or Extension appointments. This committee shall advise the Chair on policy and procedure issues, revision and implementation of the department's Implementation Plan, budget issues, personnel relations, matters pertaining to faculty and staff performance evaluation and promotion, and other aspects of the management and functions of this department.

**Undergraduate Education and Scholarship Committee** is chaired by the Undergraduate Education Coordinator (Director of Undergraduate Studies) and shall consist of three additional faculty members and an undergraduate Horticulture student. This committee shall review undergraduate curricular requirements and course offerings and shall recommend changes to the faculty and the Chair. This committee also reviews and makes recommendations on scholarship allocations.

**Graduate Studies Committee** consists of the Horticulture Graduate Faculty and a graduate student and shall be chaired by the Graduate Education Coordinator (Director of Graduate Studies). This committee reviews, studies, and makes recommendations on all pertinent aspects of the Integrated Plant and Soil Science Graduate Program.

**Horticulture Research Farm Committee** is responsible for recommending policy and procedures for the maintenance, improvement, and utilization of the research farm and greenhouse facilities of the department. This committee shall solicit proposals from the faculty for projects using these facilities and make recommendations to the Chair as to the suitability of these projects for the available resources and assignment of space and technical support. This committee shall also advise and assist the farm manager in his/her technical and management responsibilities.

**On-Campus Greenhouse Committee** is responsible for recommending policy and procedures for the maintenance, improvement, and utilization of the on-campus greenhouse facilities of the department. This committee shall also advise and assist the departmental greenhouse manager in his/her technical and management responsibilities.

## B. Faculty Meetings

Monthly faculty meetings will include all faculty and a staff representative and will be scheduled for 1.5 hours. Meetings may be extended for additional time by a 2/3 vote of faculty present. Special faculty meetings may be called by the Chair or any faculty member by delivering written notice to faculty members at least 24 hours prior to the meeting.

Faculty meeting agendas are submitted to the faculty electronically one week prior to the meeting. Items may be placed on the agenda for the faculty meeting by faculty, staff, or students by submitting them to the Chair prior to posting the agenda. Minutes will include a summary of discussions and votes and a listing of all those in attendance. Minutes of all meetings are taken by a departmental staff representative, submitted to the faculty, and filed in the departmental office.

Meetings of the faculty and faculty committees will be in compliance with the Open Meetings Law. The quorum required to conduct business is 2/3 of the voting faculty. Robert's Rules of Order will govern the conduct of all faculty meetings and standing and ad hoc committee meetings.

Monthly Faculty Meetings will typically include the following as appropriate:
1. Approval of the minutes of the previous meeting
2. Committee reports as needed
3. Old business
4. New business
5. Informational items

## C. Adjunct Faculty Appointments

The Adjunct Faculty Series is defined in the University of Kentucky Administrative Regulations. The department may recommend for adjunct status an individual who is qualified for faculty status in at least one program area of the department and committed to contribute to the department's teaching, research, and/or extension programs.

A candidate for adjunct status must be nominated and sponsored by a Horticulture faculty member. The Chair, with assistance of the nominator, will circulate a vitae and other supporting materials for faculty review. The Chair will distribute/collect the ballots or take a hand or voice vote, inform the faculty and candidate of the results of the process, and initiate the appointment approval process through the Dean's Office. The Chair is also responsible for biennial Adjunct reappointments.

## II. FACULTY SEARCH AND APPOINTMENTS

### Searches

A search committee shall be appointed by the Chair in consultation with the faculty when permission to recruit a position has been received from the administration. The search committee consists of 3-5 faculty, and one graduate student if appropriate. Additional members outside the department may be appointed when appropriate. The search will be conducted in accordance with all regulations and guidelines of the college and university.

### Reappointments, Promotions, Granting of Tenure

The department Chair is responsible for recommendations to the Dean of the college on promotions, reappointments and granting of tenure. The department will follow the Administrative Regulation (Appendix 1 of AR 2:1-1) Matrix of Minimum Consultation and Written Judgments concerning letters that will be included in a dossier for promotion and/or tenure.

### Maintenance of Records

In addition to the Standard Personnel File maintained in the Dean’s Office, a copy of records related to the progress reviews and/or reappointment that are submitted to the Chair or prepared by the Chair shall be maintained in the departmental faculty file of the subject individual.

## III. DISTRIBUTION OF EFFORT ASSIGNMENTS

In the spring of each year the Chair will formulate with each faculty member an agreement on their distribution of effort for the next year in research, teaching, extension, and any other special assignments. As per university requirements, the activities covered by the DOE constitute the major program expectations of the individual.

## IV. TWO- AND FOUR-YEAR REVIEWS

Two- and four-year reviews of progress toward tenure are mandatory for tenure-track

faculty, and the department follows the college process.

**Procedures**

1. With a minimum of 60 days' notice before the Chair intends to complete the review, the Chair notifies the faculty member in writing about the time line for the review. The chair solicits from the faculty member an updated CV in a format agreed upon by the faculty member and the Chair, a narrative statement about his or her teaching/research/extension activities, and (as appropriate) a teaching portfolio. These materials are to be made available to all tenured faculty members in the unit at the time they are informed that the review is under way and their comments are solicited.
2. For the four-year review, the Chair shall solicit e-mail or written comments from all tenured associate and full professors in the department. Assistant professors may be invited to comment, but should not be required to do so. For the two-year review, the Chair shall consult with the faculty, but this may take the form of discussion with an advisory committee or appropriate representatives of the tenured faculty. Please note, email or written comments from senior faculty members and other faculty members invited to comment are not shared directly with the faculty member under review.
3. The Chair reviews the comments solicited from faculty members and prepares a review summary. This is normally provided in the form of a letter to the faculty member being reviewed. If the review does not report satisfactory progress or considers a terminal appointment, this draft review summary and the CV are sent to the Dean prior to the Chair's presentation of the letter to, and discussion of progress with, the faculty member. If the review reports satisfactory progress, the Chair may discuss the review with the faculty member before the letter is forwarded to the Dean.
4. The Chair meets with the faculty member being reviewed and discusses the review summary. After the Chair and faculty member sign the document, the faculty member receives a copy.
5. The Chair sends an e-mail to the Associate Dean for Faculty Resources, Planning and Assessment containing the final, signed review summary and the faculty member's CV. All other documents regarding the review remain in the departmental file.
6. The signed review statement is placed in the Standard Personnel File in the Dean's Office, and recorded as completed in the Faculty Data Base.

## V. ANNUAL/BIENNIAL PERFORMANCE REVIEW OF FACULTY AND CHAIR

Faculty

In the administration of annual (untenured) and biennial (tenured) performance evaluations of faculty, the Chair seeks advice of the Departmental Advisory Committee, so the Chair accurately speaks for the unit. Faculty performance evaluations are conducted as per college rules and procedures.

Review of Chair

Departmental chairs in the College of Agriculture, Food and Environment are appointed for six years and are reviewed annually. The Dean of the college evaluates the Chair's performance, with input from faculty and staff and other constituents.

## VI. EXTENSION PROGRAM

Extension Coordinator

An Extension Coordinator will be appointed by the Chair, with approval of the Extension faculty, to assist in coordination of Extension programs and associated activities. The Extension Coordinator will serve on the Advisory Committee.

## VII. AMENDMENTS OF RULES OF PROCEDURE

The Rules of Procedure for the department may be amended at regular or special faculty meetings by a 2/3 majority vote of eligible voters present (quorum of voters required). A copy of the proposed amendment shall be dated and circulated one week prior to the meeting. No proxy votes will be accepted.

# Appendix D

## Departmental Statements on Evidence of Activity

**Statement on Evidences of Activity in Instruction, Research and Extension that are Appropriate for Use in Evaluation of Faculty Candidates for Promotion and Tenure of the Horticulture Department in the College of Agriculture, Food and Environment: Approved November 19, 2009**

General Information

University regulations establish criteria for promotion and tenure. These criteria are framed in terms of the expectation for excellence across all areas of assigned activity. The Department of Horticulture expects these criteria to be applied rigorously to all faculty title series. However, faculty in the Department of Horticulture vary with regard to disciplinary expertise as well as extension, research and instruction Distribution of Effort. Therefore, specific evidences of activity to be considered in applying these criteria may vary greatly, particularly among mission areas. This statement on evidences should not be considered as inconsistent with or contradictory neither to university level regulations, nor with the criteria expressed therein.

This statement of activities applies to evaluations at all ranks, although evidences of activity demonstrating potential, professional advancement and trajectory of program development are weighted heavily for Assistant Professors being evaluated for progress toward tenure. Whereas, evidences of career achievement, sustained scholarly record, and documented impact will be more heavily factored for evaluation of Associate and Full Professors.

Scholarly Productivity

This is most often documented through written works. Original research articles, translational or extension publications, works of synthesis (reviews), and publications about instruction and pedagogy may all be examples of scholarly productivity as appropriate to the field and assignment. Non-traditional scholarly formats such as web-based or electronic records may also be considered.

In all cases, those works that have been rigorously peer-reviewed and are creative or original will be given more weight. This applies to work derived from research, instruction or extension assignments.

In extension, most forms of information delivery, including educational meetings, workshops, field days, even individual responses and contacts, are considered evidence of activity and should be summarized, reported and considered in evaluations.

For instruction, evidence of productivity includes delivery of formal courses and student contact hours, as well as support of student engagement, experiential education, organized student activities, professional development and advising.

Quality, Innovation and Impact

Both the submitted narrative and the record should demonstrate that the overall program has direction, focus and originality, and where possible documented impact.

Publication in highly selective, rigorously refereed or juried outlets can be an important metric of quality of scholarly works. Citation index and journal metrics are becoming more frequently used as quality measures.

Research faculty are generally expected to establish a coherent body of work, focused on one or a small number of significant topics, as opposed to an unrelated collection of articles or materials. In some cases, particularly for applied research, a broad, diverse portfolio of successful studies is justified on the basis of responsiveness to critical needs.

Quality extension programs are characterized by responsiveness, direction and relevance; they are science and research based; they employ creative, effective methods of education and communication. Extension programs should be associated with high quality materials or works in relevant, appropriate, accessible outlets. Quantitative or at least systematic assessment is particularly useful in extension programming.

Student teaching evaluations are considered to be a valid, if approximate, index of teaching quality particularly when considered in conjunction with other measures. Professional development and teaching improvement activities are considered to document commitment to quality instruction.

A demonstrated record of sustaining scholarly productivity through funding or support for the program as appropriate to the field can be an important factor, particularly for research assignments.

Peer recognition also is considered as evidence of quality.

When they are available, documented benefits to stakeholders, e.g., changed practice, profit, or quality of life can be important measures, not just for extension but for all faculty activities.

Collaborative Efforts, Recognition, Professional Service and Leadership

As leaders of a public, land grant institution, faculty in the Department of Horticulture are required to be highly accessible, responsive and interactive with peers, students and constituents. Horticulture faculty are expected to engage in collaborative work as appropriate to the advancement of their and the department's programs. In instruction, contributions to student success beyond formal classroom success (e.g., advising, activities, and positive interaction) can be important evaluation factors.

Documentation of peer recognition may include significant awards, invitations to make presentations externally, service on national panels or committees, editorial appointments, leadership positions in professional societies, international recognition, and other indicators. Nationally competitive grants may be significant evidence of peer recognition in many fields.

University, college or department level service may be offered as documentation of leadership in a major DOE area (research, teaching, extension) or it may be evaluated as a special assignment, as agreed upon by the chair and the faculty member.

Exceptional individual performance is typically associated with notable positive impact on the success of students, colleagues, and the department, through leadership and professional service.

# Appendix E

## 2019 UK@Work Survey


# 2019 UK@Work Survey

**University of Kentucky 2019 Engagement Survey**

Horticulture & Arboretum (23)

# Definition of Terms

**"University"** or **"UK"** refers to University of Kentucky as a whole.

**"Department"** refers to your local group or team (e.g. Economics, Biology, Civil Engineering, Training and Development, Residence Life).

**"College Leadership"** refers to the dean's office in your college; if you work in more than one college, consider the college where you spend the most time.

**"Unit Leadership"** refers to:

- senior leadership in an academic support unit (e.g. Enrollment Management, PBO, SAL)
- OR senior leaders at the centers, institutes, facilities and research support units within VP Research
- OR senior leaders in a unit that reports directly to the President (e.g. Institutional Diversity, Legal, Athletics, Philanthropy, University Relations).

**"Area Leadership"** refers to senior leadership of an area within the EVPFA (e.g. Facilities Management, Financial Services, CBO, HR, ITS, Public Safety).

**"Supervisor"** refers to the person who has primary responsibility for managing your activities. This is the person to whom you report to on a day-to-day basis and who provides your performance evaluation.

# How to Read Results

## Scores

Scores shown are the total Percent Favorable (typically the top two options), or the Top Box. For example:

| Agree | Tend to Agree | ? | Tend to Disagree | Disagree |
|---|---|---|---|---|
| ■ | ■ | ☐ | ☐ | ☐ |

Top Box + Other Favorable

## Differences and Colors

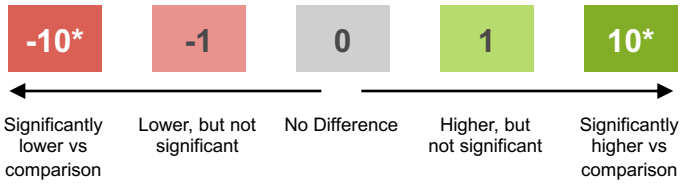
Differences to norms are shown as % points. Norms may include past surveys, parent groups, industry, national or high performance benchmarks.

| For example: | | Total Favorable Score | Historical | Parent Group | Company Overall | Industry Norm |
|---|---|---|---|---|---|---|
| **Employee Engagement** | | **76** | **-8*** | **3*** | **3*** | **-10*** |
| 3 | I have a good understanding of our goals. ◎ | **74** | n/a | **1** | **-9*** | **2*** |
| **12** | I have a good understanding of how my job contributes to achieving our goals. ★ | **78** | **1** | **4*** | **-1** | **0** |

## Icons (if applicable)

| | |
|---|---|
| # | When a question number is shown in red it is a priority issue. |
| ◎ | Strategic Priority Question |
| ★ | Key driver question. |
| (N) | On some questions disagreeing is the favorable response. |
| n/a | Score not available |

* **Statistically significant** differences are indicated with asterisks and darker colors. They are meaningful differences, where we are 95% confident it did not occur by chance. The cut-off for significance varies according to the size of the groups being compared. Small groups require a bigger difference for it to be significant.

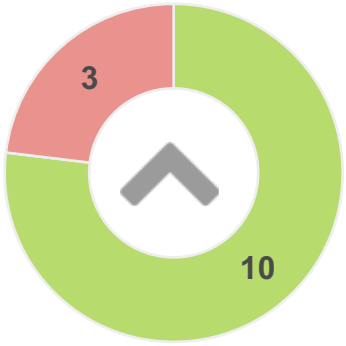


# Results Summary

Horticulture & Arboretum (23) - Scores based on Total Favorable

## Results vs. Horticulture & Arboretum 2017

**10** Out Of **13** Categories Have Improved




**Most Improved**

Supervision 15
Working Relationships 12
Leadership 10

**Most Declined**

Pay & Benefits -4
University Culture -2
Communication -1

## Results vs. Universities Norm

**6** Out Of **11** Categories Are Below


**Most Favorable**

Performance Evaluation 11
Supervision 10
Career Development 2

**Least Favorable**

Communication -10
Sustainable Engagement -8
Diversity & Inclusion -4

## Sustainable Engagement


| Horticulture & Arboretum 2017 | Universities Norm | US Norm | University of Kentucky Overall 2019 |
|---|---|---|---|
| ↑ 4 | ↓ -8 | ↓ -12 | ↓ -12 |

### Strengths

- Performance Evaluation, Supervision

### Opportunities

- Stress, Balance, & Workload, Sustainable Engagement

# Strengths and Opportunities

## Horticulture & Arboretum (23)

### Strengths

We should continue to build on these.

| | | % Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | US Norm (148,326) | University of Kentucky Overall 2019 (5,770) |
|---|---|---|---|---|---|---|
| 15a | My Department Chair/Director/Dean/Supervisor: Treats me with respect | 96 | 23* | 9 | 7 | 6 |
| 47 | At UK, I understand how my work performance is evaluated. | 87 | 15 | 16 | 8 | 5 |
| 15c | My Department Chair/Director/Dean/Supervisor: Gives me regular feedback on my performance | 83 | 13 | 14 | 6 | 6 |

### Opportunities

These are our priority areas to focus on.

| | | % Favorable | Horticulture & Arboretum 2017 | Universities Norm | US Norm | University of Kentucky Overall 2019 |
|---|---|---|---|---|---|---|
| 48 | I have the equipment/resources I need to do my work effectively. | 52 | -2 | -19* | -24* | -27* |
| 27 | I am proud to be associated with UK. | 70 | -12 | -18* | -19* | -19* |
| 28 | Overall, the physical working conditions at my location are satisfactory (e.g., ventilation, temperature, space to work). | 52 | 10 | -22* | -28* | -17 |

These questions were chosen through an advanced algorithm that incorporates trends over time, difference from internal and external benchmarks, and predictive modelling of engagement and performance metrics, where available.

# Suggested Actions

Horticulture & Arboretum (23)

**WHAT WE COULD DO**

"Best practice" suggested actions

- **Drive Sustainable Engagement**

  To improve engagement in this category, focus on the 2019 Key Drivers: Empowerment, Diversity & Inclusion, Career Development and Stress, Balance, & Workload.

- **Drive Sustainable Engagement**

  To improve engagement in this category, focus on the 2019 Key Drivers: Empowerment, Diversity & Inclusion, Career Development and Stress, Balance, & Workload.

- **Ensure the physical working conditions are satisfactory (ventilation, temperature, space to work, etc.)**

  Pay particular attention to: physical work conditions (comfortable and conducive to high productivity), the resources required to do the work (physical, financial, informational) and safety features to ensure that the work environment supports faculty and staff satisfaction. Additionally, ensure that employees are aware of any inherent risks in their job, and that they know how to reduce these risks. This may mean going beyond simply sharing safety policies and procedures by having one-to-one conversations with employees in high-risk roles. Discuss openly any risks that either of you see. Be sure to focus on how to mitigate each risk.

# Group Sizes

## Horticulture & Arboretum (23)

**Benchmarks**

| | | | |
|---|---|---|---|
| Horticulture & Arboretum 2017 | 33 | University of Kentucky Overall 2019 | 5,770 |
| Horticulture & Arboretum 2015 | 22 | Universities Norm | 36,848 |
| College of Ag, Food and Environment Overall 2019 | 878 | US Norm | 148,326 |
| Provost Overall 2019 | 3,801 | | |

# Categories vs. Benchmarks

## Horticulture & Arboretum (23)

| | Total Favorable Score | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|
| Sustainable Engagement | 70 | 4 | -8 | -12 | -16* |
| University Culture | 59 | -2 | n/a | -15 | -13 |
| Leadership | 58 | 10 | 0 | -8 | -7 |
| Communication | 52 | -1 | -10 | -11 | -9 |
| Diversity & Inclusion | 74 | 6 | -4 | -2 | -2 |
| Operating Effectively | 49 | 2 | n/a | -12 | -12 |
| Empowerment | 66 | 9 | 0 | -4 | -6 |
| Supervision | 85 | 15 | 10 | 5 | 6 |
| Working Relationships | 69 | 12 | -2 | -8 | -7 |
| Performance Evaluation | 74 | 7 | 11 | -3 | -5 |
| Career Development | 61 | 10 | 2 | -7 | -9 |
| Stress, Balance, & Workload | 57 | 4 | -4 | -7 | -12 |
| Pay & Benefits | 48 | -4 | -3 | -15 | -11 |

# Questions vs. Benchmarks - Sustainable Engagement (1 of 2)

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Sustainable Engagement** | | **70** | 4 | -8 | -12 | -16* |
| 13 | I am able to sustain the level of energy I need throughout the work day. | **65** | -4 | -11 | -12 | -15 |
| 24 | My work gives me a sense of personal accomplishment. | **87** | 8 | 2 | 1 | -2 |
| 26 | My department is able to meet our work challenges effectively. | **65** | 14 | -10 | -12 | -17* |
| 27 | I am proud to be associated with UK. | **70** | -12 | -18* | -19* | -22* |
| 34 | I believe strongly in the goals and mission of the University. | **74** | -8 | -8 | -15* | -16* |
| 37 | My colleagues usually get along well together. | **83** | 25* | -2 | -3 | -3 |
| 48 | I have the equipment/resources I need to do my work effectively. | **52** | -2 | -19* | -27* | -34* |

# Questions vs. Benchmarks - Sustainable Engagement (2 of 2)

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Sustainable Engagement** | | **70** | **4** | **-8** | **-12** | **-16*** |
| **50** | There are no substantial obstacles at the University to doing my work well. | **52** | **10** | **-7** | **-19*** | **-26*** |
| **56** | I would recommend UK as a good place to work. | **78** | n/a | **1** | **-5** | **-8** |

# Questions vs. Benchmarks - University Culture

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **University Culture** | | **59** | **-2** | n/a | **-15** | **-13** |
| **9** | I think I could report instances of dishonest or unethical practices to the appropriate level of authority without fear of reprisal. | **57** | **-1** | n/a | **-12** | **-8** |
| **16** | UK is highly regarded by its faculty/staff. | **48** | **2** | **-21*** | **-25*** | **-24*** |
| **44** | We have an institutional culture that promotes collaboration. | **57** | **-6** | n/a | **-15** | **-18*** |
| **51** | UK is student-oriented. | **74** | n/a | n/a | **-8** | **-3** |

# Questions vs. Benchmarks - Leadership

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Leadership** | | **58** | **10** | **0** | **-8** | **-7** |
| **1** | I have confidence in the decisions made by my college / unit / area leadership. | **65** | **23** | **6** | **-9** | **-6** |
| **2** | There is sufficient contact between college / unit / area leadership and faculty/staff at UK. | **57** | **14** | **9** | **-10** | **-6** |
| **7** | The leadership of my college / unit / area make decisions that are consistent with the values. | **61** | **0** | **-4** | **-11** | **-8** |
| **8** | I think action will be taken based on the problems identified in the survey. | **39** | **0** | **-17** | **-8** | **-7** |
| **38** | Faculty/staff are treated with respect here regardless of their position. | **70** | **15** | **4** | **-1** | **-6** |

# Questions vs. Benchmarks - Communication

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Communication** | | **52** | **-1** | **-10** | **-11** | **-9** |
| **11** | UK does an excellent job of keeping faculty/staff informed about matters affecting us. | **61** | **-3** | **-3** | **-7** | **-3** |
| **14** | Sufficient effort is made to get the opinions and thinking of faculty/staff. | **43** | **1** | **-17** | **-16** | **-15** |

# Questions vs. Benchmarks - Diversity & Inclusion

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Diversity & Inclusion** | | **74** | **6** | **-4** | **-2** | **-2** |
| **4** | My college / unit / area leadership recognizes and respects the value of human differences. | **78** | **6** | **-4** | **-1** | **-3** |
| **18** | I can be myself at UK without worrying about how I will be accepted. | **78** | n/a | n/a | **3** | **3** |
| **42** | UK effectively addresses campus incidents of intolerance and bigotry. | **65** | **-4** | n/a | **-3** | **0** |
| **45** | I feel a sense of community at UK. ★ | **70** | **12** | n/a | **-4** | **-4** |
| **49** | UK provides a working environment that is accepting of differences in personal identity. | **86** | n/a | n/a | **3** | **2** |
| **55** | I feel that my college / unit / area leadership supports equal opportunity for all faculty/staff. ★ | **68** | **11** | **-4** | **-7** | **-8** |

# Questions vs. Benchmarks - Operating Effectively

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Operating Effectively** | | **49** | **2** | n/a | **-12** | **-12** |
| **21** | In my opinion, decisions at UK are made in a timely manner. | **43** | **-2** | **-2** | **-6** | **-5** |
| **30** | Decisions at UK are made at the appropriate level. | **48** | **8** | n/a | **-11** | **-6** |
| **36** | My department operates effectively. | **57** | **-1** | n/a | **-19*** | **-23*** |

# Questions vs. Benchmarks - Empowerment

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Empowerment** | | **66** | **9** | **0** | **-4** | **-6** |
| **5** | I have a very clear idea of the responsibilities for my faculty position/job. | **87** | **5** | **-2** | **-2** | **-4** |
| **19** | I am satisfied with my involvement in decisions that affect my work. ★ | **70** | **15** | **6** | **0** | **-2** |
| **22** | UK has established a climate where people can challenge our traditional ways of doing things. | **43** | **4** | **-9** | **-11** | **-13** |
| **25** | Colleagues in my department are encouraged to come up with innovative solutions to work-related problems. | **78** | **18** | **7** | **5** | **4** |
| **52** | I am satisfied with the procedures available for resolving faculty/staff complaints. | **43** | **4** | n/a | **-10** | **-8** |
| **54** | The information I need to do my work is readily available. ★ | **74** | **10** | **-3** | **-9** | **-13** |

# Questions vs. Benchmarks - Supervision

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Supervision** | | **85** | **15** | **10** | **5** | **6** |
| **15a** | My Department Chair/Director/Dean/Supervisor: Treats me with respect | **96** | **23*** | **9** | **6** | **5** |
| **15b** | My Department Chair/Director/Dean/Supervisor: Communicates effectively | **83** | **11** | **6** | **3** | **3** |
| **15c** | My Department Chair/Director/Dean/Supervisor: Gives me regular feedback on my performance | **83** | **13** | **14** | **6** | **6** |
| **53** | My supervisor does a good job of building teamwork. (staff only) | **79** | **14** | **10** | **6** | **8** |

# Questions vs. Benchmarks - Working Relationships

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Working Relationships** | | **69** | **12** | **-2** | **-8** | **-7** |
| **10** | My colleagues/the people I work with are willing to help each other, even if it means doing something outside their usual activities. | **74** | **10** | **-7** | **-10** | **-10** |
| **23** | There is a strong feeling of trust between members of my department. | **52** | **2** | n/a | **-14** | **-13** |
| **29** | Differing opinions are openly discussed in reaching decisions in my department. | **74** | **25** | **3** | **6** | **7** |
| **31** | My department constantly looks for better ways to serve its students or internal customers. | **74** | n/a | n/a | **-6** | **-4** |
| **33** | People in my department treat each other with respect. | **70** | **9** | n/a | **-15** | **-15** |

# Questions vs. Benchmarks - Performance Evaluation

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Performance Evaluation** | | **74** | **7** | **11** | **-3** | **-5** |
| **12** | Where I work, my colleagues are accountable for following through on what they have promised. | **57** | **-4** | n/a | **-17** | **-16** |
| **39** | At UK, I think my work performance is evaluated fairly. | **78** | **9** | **6** | **3** | **0** |
| **47** | At UK, I understand how my work performance is evaluated. | **87** | **15** | **16** | **5** | **1** |

# Questions vs. Benchmarks - Career Development

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Career Development** | | **61** | **10** | **2** | **-7** | **-9** |
| **6** | I have a reasonably good idea of my possible career paths at UK. (staff only) | **63** | **5** | **-1** | **-7** | **-12** |
| **35** | I think the University is doing a good job of retaining its most talented faculty and staff. | **48** | **14** | **12** | **-5** | **-4** |
| **40** | At UK, there are sufficient opportunities for me to receive training to improve my skills in my current faculty/staff position. | **65** | **5** | **-3** | **-9** | **-14** |
| **46** | I believe I have the opportunity for personal development and growth at the University. | **70** | **15** | **2** | **-5** | **-5** |

# Questions vs. Benchmarks - Stress, Balance, & Workload

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Stress, Balance, & Workload** | | **57** | **4** | **-4** | **-7** | **-12** |
| **3** | Work is usually appropriately distributed among faculty/staff in my department. ★ | **65** | **20** | **4** | **-1** | **-2** |
| **20** | My work schedule allows sufficient flexibility to meet my personal/family needs. | **87** | **2** | **6** | **5** | **0** |
| **28** | Overall, the physical working conditions at my location are satisfactory (e.g., ventilation, temperature, space to work). | **52** | **10** | **-22*** | **-17** | **-21*** |
| **32** | There is usually sufficient staffing in my department to handle the workload. ★ | **48** | **1** | **-2** | **-8** | **-23*** |
| **41** | The amount of stress I experience at work significantly reduces my effectiveness. (N) | **35** | **-14** | n/a | **-13** | **-14** |

# Questions vs. Benchmarks - Pay & Benefits

Horticulture & Arboretum (23)

| | | Total Favorable | Horticulture & Arboretum 2017 (33) | Universities Norm (36,848) | University of Kentucky Overall 2019 (5,770) | College of Ag, Food and Environment Overall 2019 (878) |
|---|---|---|---|---|---|---|
| **Pay & Benefits** | | **48** | **-4** | **-3** | **-15** | **-11** |
| **17** | From what I hear, our pay is as good as or better than the pay in similar institutions. | **35** | **8** | **-4** | **-10** | **-4** |
| **43** | From what I hear, our benefits are as good as or better than the benefits in similar institutions. | **61** | **-15** | **-1** | **-20*** | **-18*** |

# Appendix F

## Horticulture Job Market Analysis by Burning Glass Report

# VALIDATE: EMPLOYMENT POTENTIAL

## PROJECT CRITERIA

| Validate | Programs |
|---|---|
| Location | Nationwide |
| Degree Level | Bachelor's degree |
| Time Period | 2/1/2019 - 1/31/2020 |
| Selected Programs | Agricultural and Horticultural Plant Breeding (01.1104), Horticultural Science (01.1103), Plant Protection and Integrated Pest Management (01.1105), Applied Horticulture/Horticultural Business Services, Other (01.0699), Applied Horticulture/Horticulture Operations, General (01.0601), Floriculture/Floristry Operations and Management (01.0608), Greenhouse Operations and Management (01.0604), Landscaping and Groundskeeping (01.0605), Ornamental Horticulture (01.0603), Plant Nursery Operations and Management (01.0606) |
| Career Outcomes mapped to Selected Programs of Study | Landscaping / Grounds Supervisor, Food / Agricultural Technician, Farm / Ranch Manager, Soil / Plant Scientist, Nursery / Greenhouse Manager, Food and Agricultural Scientist / Technologist |

## HOW MANY JOBS ARE THERE FOR YOUR GRADUATES?

For your project criteria, there were 11,385 job postings in the last 12 months.

Compared to:

- 37,318,056 total job postings in your selected location
- 12,761,971 total job postings requesting a Bachelor's degree in your selected location

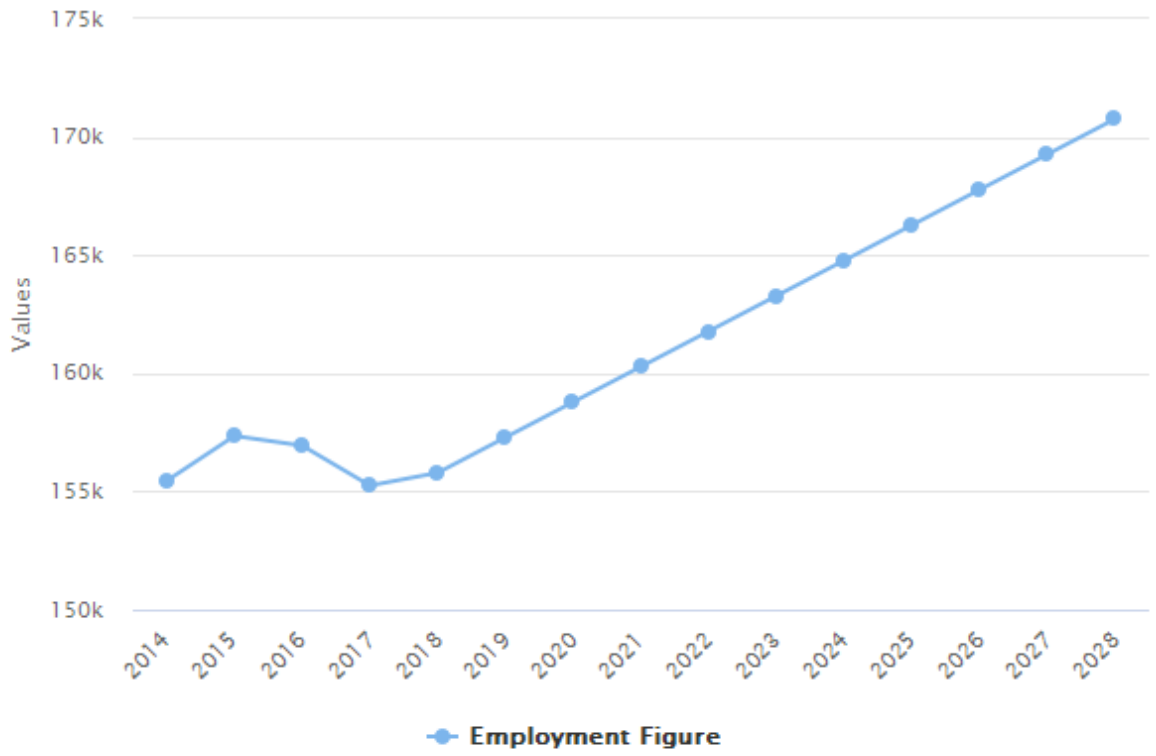
The number of jobs is expected to grow over the next 10 years.

## GROWTH BY GEOGRAPHY

| Geography | Selected Occupations | Total Labor Market | Relative Growth |
|---|---|---|---|
| Nationwide | 9.61 % | 5.78 % | Average |

## HOW HAS EMPLOYMENT CHANGED FOR CAREER OUTCOMES OF YOUR PROGRAM?

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2028 |
|---|---|---|---|---|---|---|
| Employment (BLS) | 155,450 | 157,350 | 156,940 | 155,250 | 155,790 | 170,767 |




Employment data between years 2019 and 2028 are projected figures.

## DETAILS BY OCCUPATION

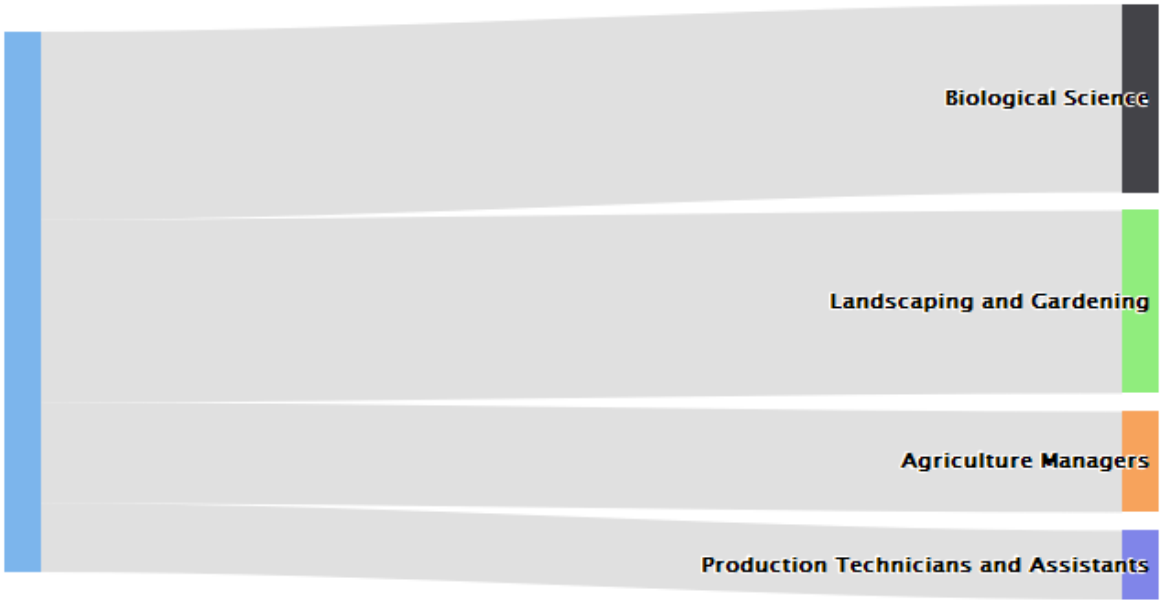
| Occupation Group | Postings | LQ | Employment (2018) | Employment Growth (2017 - 2018) | Projected Employment Growth (2019-2028) |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Biological Science | 3,960 | NA | 28,340 | -2.9% | 7.5% |
| Landscaping and Gardening | 3,853 | NA | 101,390 | 1.1% | 11.4% |
| Agriculture Managers | 2,122 | NA | 4,770 | 3.5% | -0.8% |
| Production Technicians and Assistants | 1,450 | NA | 21,290 | 0.8% | 6.2% |

## HOW VERSATILE IS MY PROGRAM?

Graduates of this program usually transition into any of the 4 different occupation groups:

| Occupations Group | Market Size (postings) | Percentage of Career Outcome demand |
|---|---|---|
| Biological Science | 3,960 | 34.8% |
| Landscaping and Gardening | 3,853 | 33.8% |
| Agriculture Managers | 2,122 | 18.6% |
| Production Technicians and Assistants | 1,450 | 12.7% |



## WHAT SALARY WILL MY GRADUATES MAKE?

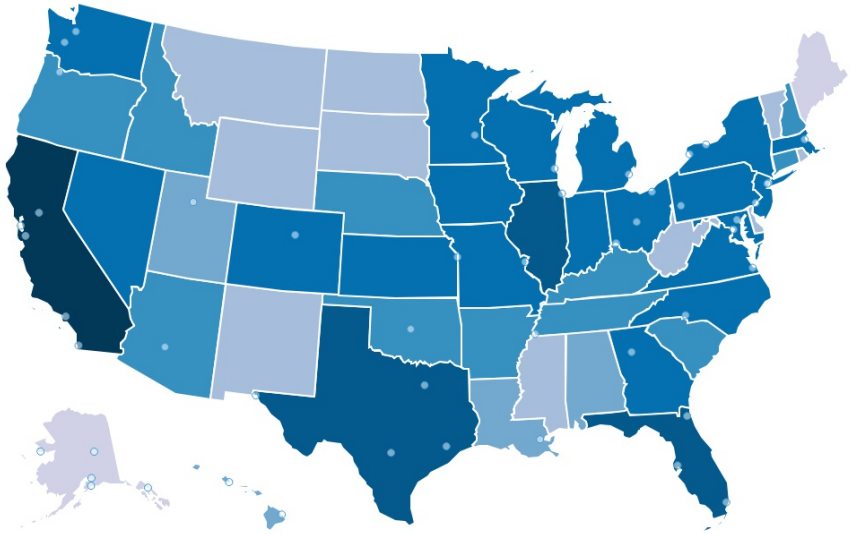
The average salary in the nation for graduates of your program is $52,450

This average salary is Above the average living wage for your region of 31450


Salary numbers are based on Burning Glass models that consider advertised job posting salary, BLS data, and other proprietary and public sources of information.

| Occupation Group | 0-2 Years | 3-5 Years | 6+ Years |
|---|---|---|---|
| Biological Science | $50807 | $65706 | $70151 |
| Landscaping and Gardening | $38507 | $49666 | $51003 |
| Production Technicians and Assistants | $40858 | $52642 | $56570 |
| Agriculture Managers | $50795 | $57764 | $61703 |

## WHERE IS THE DEMAND FOR MY GRADUATES?



## TOP LOCATIONS BY POSTING DEMAND

| Location | Postings |
|---|---|
| California | 1,842 |
| Texas | 920 |
| Illinois | 575 |
| Florida | 503 |
| North Carolina | 450 |
| Ohio | 441 |
| Pennsylvania | 440 |
| New York | 411 |
| Minnesota | 370 |
| Michigan | 359 |

# VALIDATE: COMPETITIVE LANDSCAPE

## PROJECT CRITERIA

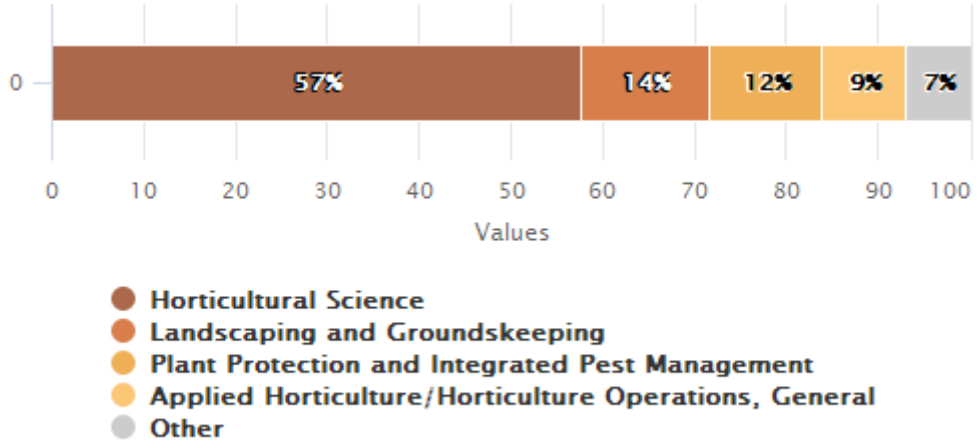
| | |
|---|---|
| Validate | Programs |
| Location | Nationwide |
| Degree Level | Bachelor's degree |
| Time Period | 2/1/2019 - 1/31/2020 |
| Selected Programs | Agricultural and Horticultural Plant Breeding (01.1104), Horticultural Science (01.1103), Plant Protection and Integrated Pest Management (01.1105), Applied Horticulture/Horticultural Business Services, Other (01.0699), Applied Horticulture/Horticulture Operations, General (01.0601), Floriculture/Floristry Operations and Management (01.0608), Greenhouse Operations and Management (01.0604), Landscaping and Groundskeeping (01.0605), Ornamental Horticulture (01.0603), Plant Nursery Operations and Management (01.0606) |
| Career Outcomes mapped to Selected Programs of Study | Landscaping / Grounds Supervisor, Food / Agricultural Technician, Farm / Ranch Manager, Soil / Plant Scientist, Nursery / Greenhouse Manager, Food and Agricultural Scientist / Technologist |

## OVERVIEW

| | # | % Change (2014-2018) |
|---|---|---|
| Degrees Conferred | 922 | -13% |
| Number of Institutions | 64 | -4% |

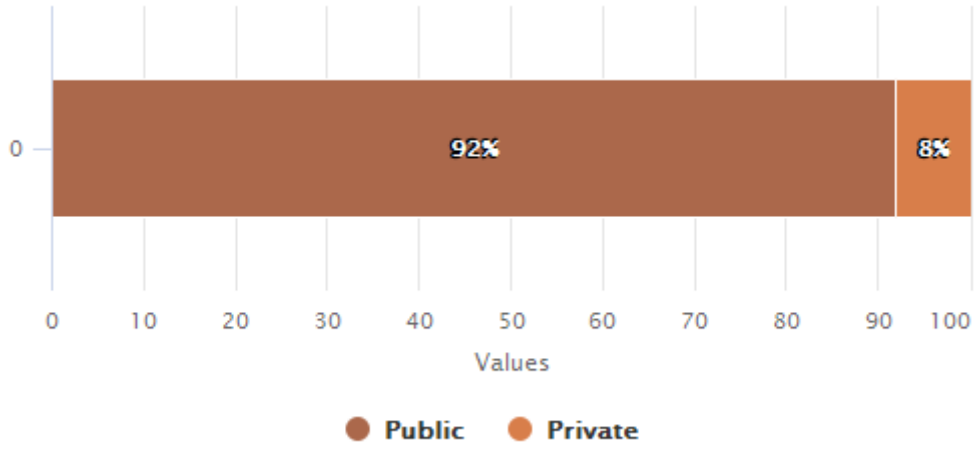
| | | |
|---|---|---|
| Average Conferrals by Institution | 14 | -12.50% |
| Median Conferrals by Institution | 10 | -16.70% |

## MARKET SHARE BY PROGRAM




| Program | Conferrals (2018) | Market Share (%) |
|---|---|---|
| Horticultural Science | 521 | 56.51% |
| Landscaping and Groundskeeping | 132 | 14.32% |
| Plant Protection and Integrated Pest Management | 113 | 12.26% |
| Applied Horticulture/Horticulture Operations, General | 87 | 9.44% |
| Other | 69 | 7.48% |

## MARKET SHARE BY INSTITUTION TYPE




| Institution Type | Conferrals (2018) | Market Share (%) |
|---|---|---|
| Public | 844 | 91.54% |
| Private | 78 | 8.46% |

## TOP INSTITUTIONS

| Institution | School Type | Market Share (2018) | Market Share Change | Conferrals (2018) | Conferrals Change (2014-2018) |
|---|---|---|---|---|---|
| California State University-Fresno | Public | 6.29% | 6.29% | 58 | 100.00% |
| California State Polytechnic University-Pomona | Public | 5.42% | 2.61% | 50 | 66.70% |
| Texas A & M University-College Station | Public | 4.66% | -0.77% | 43 | -25.90% |
| Colorado State University-Fort Collins | Public | 4.56% | -0.59% | 42 | -23.60% |
| University of Nebraska-Lincoln | Public | 4.12% | 0.47% | 38 | -2.60% |
| Brigham Young University-Idaho | Private | 4.01% | 1.39% | 37 | 32.10% |

| | | | | | |
|---|---|---|---|---|---|
| Iowa State University | Public | 3.69% | 0.41% | 34 | -2.90% |
| Auburn University | Public | 3.69% | -0.52% | 34 | -24.40% |
| Oregon State University | Public | 3.69% | -0.06% | 34 | -15.00% |
| Michigan State University | Public | 3.04% | -0.24% | 28 | -20.00% |

## TOP PROGRAMS

| Program | Market Share (2018) | Market Share Change | Conferrals (2018) | Conferrals Change (2014-2018) |
|---|---|---|---|---|
| Horticultural Science | 56.51% | -2.10% | 521 | -16.80% |
| Landscaping and Groundskeeping | 14.32% | 1.02% | 132 | -7.00% |
| Plant Protection and Integrated Pest Management | 12.26% | 7.77% | 113 | 135.40% |
| Applied Horticulture/Horticulture Operations, General | 9.44% | -7.23% | 87 | -51.10% |
| Applied Horticulture/Horticultural Business Services, Other | 3.47% | 1.69% | 32 | 68.40% |
| Ornamental Horticulture | 3.04% | -1.55% | 28 | -42.90% |
| Agricultural and Horticultural Plant Breeding | 0.65% | 0.46% | 6 | 200.00% |
| Plant Nursery Operations and Management | 0.22% | 0.13% | 2 | 100.00% |
| Floriculture/Floristry Operations and Management | 0.11% | -0.17% | 1 | -66.70% |

## ACTIVE COMPETITORS

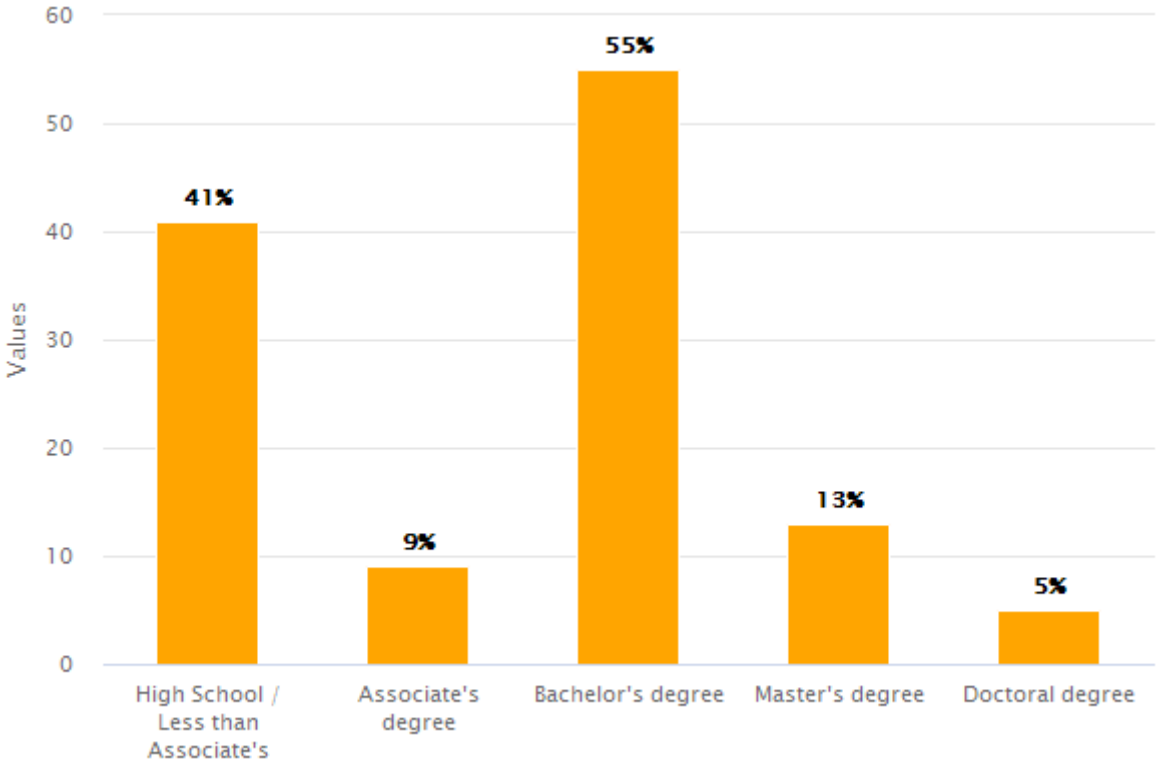
| Institution | School Type | Market Share (2018) | Market Share Change | Conferrals (2018) | Conferrals Change (2014-2018) |
|---|---|---|---|---|---|

# VALIDATE: MARKET ALIGNMENT

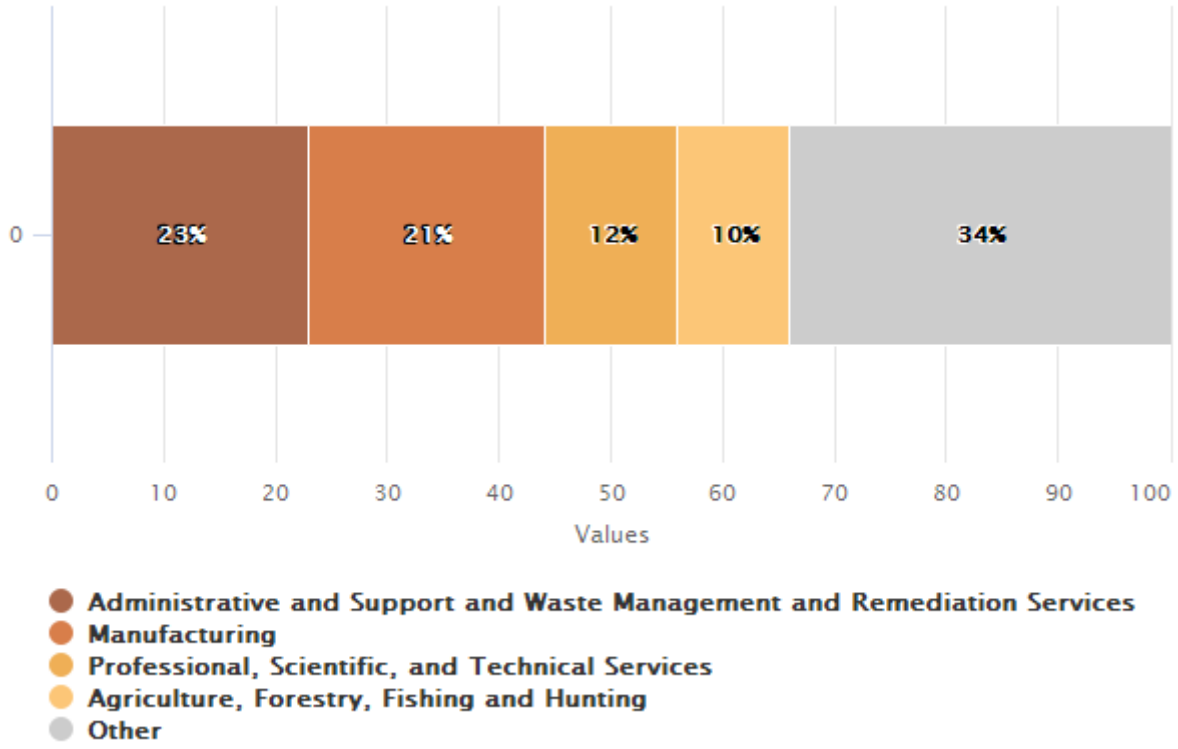
## PROJECT CRITERIA

| | |
|---|---|
| Validate | Programs |
| Location | Nationwide |
| Degree Level | Bachelor's degree |
| Time Period | 2/1/2019 - 1/31/2020 |
| Selected Programs | Agricultural and Horticultural Plant Breeding (01.1104), Horticultural Science (01.1103), Plant Protection and Integrated Pest Management (01.1105), Applied Horticulture/Horticultural Business Services, Other (01.0699), Applied Horticulture/Horticulture Operations, General (01.0601), Floriculture/Floristry Operations and Management (01.0608), Greenhouse Operations and Management (01.0604), Landscaping and Groundskeeping (01.0605), Ornamental Horticulture (01.0603), Plant Nursery Operations and Management (01.0606) |
| Career Outcomes mapped to Selected Programs of Study | Landscaping / Grounds Supervisor, Food / Agricultural Technician, Farm / Ranch Manager, Soil / Plant Scientist, Nursery / Greenhouse Manager, Food and Agricultural Scientist / Technologist |

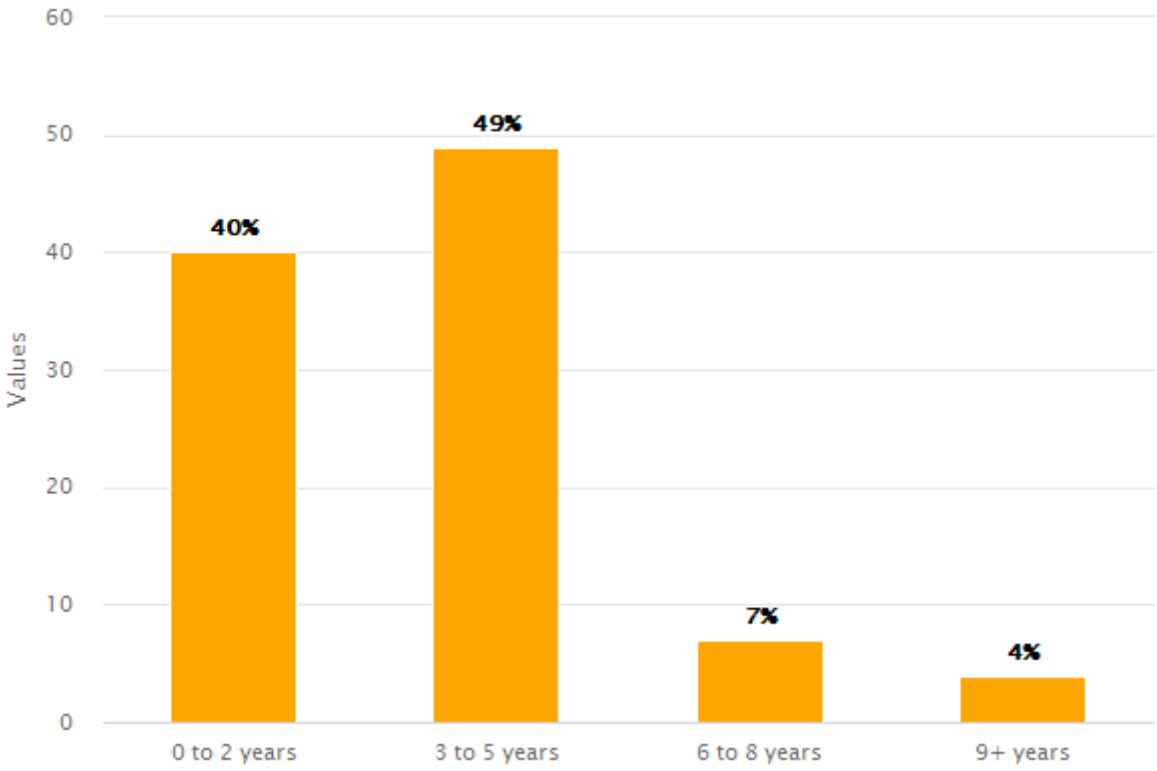
## JOB POSTINGS BY ADVERTISED EDUCATION (%)




## JOB POSTINGS BY INDUSTRY (%)




## JOB POSTINGS BY EXPERIENCE REQUESTED (%)




## TOP TITLES

**Experience Level:** All Experience

| Title | Postings | Market Share (%) |
|---|---|---|
| Landscaping Crew Leader | 262 | 4.93% |
| Food Technologist | 222 | 4.18% |
| Manager, Agriculture Industry | 191 | 3.59% |
| Agronomist | 167 | 3.14% |
| Branch Manager | 154 | 2.90% |
| Food Scientist | 149 | 2.80% |
| Arborist/Crew Leader | 137 | 2.58% |
| Food Safety Auditor | 116 | 2.18% |
| Trainee, Soil Conservation | 92 | 1.73% |
| Assistant Manager | 91 | 1.71% |

| | | |
|---|---|---|
| Landscape Manager | 90 | 1.69% |
| Landscape Foreman | 81 | 1.52% |
| Quality Technician | 81 | 1.52% |
| Specialist | 80 | 1.50% |
| Product Development Scientist | 78 | 1.47% |

## TOP EMPLOYERS HIRING

**Experience Level:** All Experience

| Employer | Postings | Market Share (%) |
|---|---|---|
| Brightview | 278 | 5.23% |
| ServiceMaster | 201 | 3.78% |
| US Department of Agriculture | 114 | 2.14% |
| Bayer Corporation | 83 | 1.56% |
| The Brickman Group, Ltd | 58 | 1.09% |
| Cargill Incorporated | 52 | 0.98% |
| Johnson & Johnson | 45 | 0.85% |
| Indigo | 35 | 0.66% |
| Underwriters Laboratories Incorporated | 35 | 0.66% |
| Afc Franchise Corp | 34 | 0.64% |
| Symmetry Financial Group | 34 | 0.64% |
| Ul | 31 | 0.58% |
| Land O' Lakes, Inc | 29 | 0.55% |
| Mars Incorporated | 26 | 0.49% |
| Toll Brothers Incorporated | 26 | 0.49% |

# VALIDATE: KEY COMPETENCIES

## PROJECT CRITERIA

| | |
|---|---|
| Validate | Programs |
| Location | Nationwide |
| Degree Level | Bachelor's degree |
| Time Period | 2/1/2019 - 1/31/2020 |
| Selected Programs | Agricultural and Horticultural Plant Breeding (01.1104), Horticultural Science (01.1103), Plant Protection and Integrated Pest Management (01.1105), Applied Horticulture/Horticultural Business Services, Other (01.0699), Applied Horticulture/Horticulture Operations, General (01.0601), Floriculture/Floristry Operations and Management (01.0608), Greenhouse Operations and Management (01.0604), Landscaping and Groundskeeping (01.0605), Ornamental Horticulture (01.0603), Plant Nursery Operations and Management (01.0606) |
| Career Outcomes mapped to Selected Programs of Study | Landscaping / Grounds Supervisor, Food / Agricultural Technician, Farm / Ranch Manager, Soil / Plant Scientist, Nursery / Greenhouse Manager, Food and Agricultural Scientist / Technologist |

## TOP 15 SPECIALIZED SKILLS

| Skill | Postings | Projected Growth | Salary Premium | Competitive Advantage |
|---|---|---|---|---|
| Budgeting | 1245 (10%) | -10.04% | Yes | No |
| Project Management | 865 (7%) | -19.74% | Yes | No |

| | | | | |
|---|---|---|---|---|
| Cost Control | 668 (6%) | -6.38% | Yes | No |
| Food Safety | 1388 (12%) | 35.19% | No | No |
| Scheduling | 1326 (11%) | 1.88% | No | No |
| Food Science | 1145 (10%) | -30.55% | No | No |
| Quality Assurance and Control | 1121 (9%) | 39.46% | No | No |
| Sales | 1009 (8%) | -11.17% | No | No |
| Agronomy | 988 (8%) | -85.44% | No | No |
| Repair | 979 (8%) | 0.38% | No | No |
| Customer Service | 960 (8%) | 1.05% | No | No |
| Product Development | 760 (6%) | -4.41% | No | No |
| Fertilizers | 716 (6%) | -64.48% | No | No |
| Customer Contact | 696 (6%) | -11.38% | No | No |

| | | | | |
|---|---|---|---|---|
| Oral Irrigation | 669 (6%) | 14.91% | No | No |

## TOP 15 BASELINES SKILLS

| Skill | Postings |
|---|---|
| Communication Skills | 3768 (31%) |
| Organizational Skills | 2058 (17%) |
| Physical Abilities | 1686 (14%) |
| Microsoft Excel | 1644 (14%) |
| Research | 1558 (13%) |
| Detail-Oriented | 1482 (12%) |
| Teamwork / Collaboration | 1431 (12%) |
| Problem Solving | 1298 (11%) |

| | |
|---|---|
| Microsoft Office | 1203 (10%) |
| Planning | 1188 (10%) |
| Leadership | 1139 (10%) |
| Computer Literacy | 1072 (9%) |
| Creativity | 1027 (9%) |
| Microsoft Word | 954 (8%) |
| Time Management | 906 (8%) |

## TOP 15 SOFTWARE PROGRAMMING SKILLS

| Skill | Postings | Projected Growth | Salary Premium | Competitive Advantage |
|---|---|---|---|---|
| Microsoft Excel | 1644 (14%) | 17.03% | No | No |
| Microsoft Office | 1203 (10%) | -10.2% | No | No |

| | | | | |
|---|---|---|---|---|
| Microsoft Word | 954 (8%) | -13.39% | No | No |
| Microsoft Powerpoint | 774 (6%) | -8.52% | No | No |
| Microsoft Access | 156 (1%) | -57.74% | No | No |
| Microsoft Outlook | 150 (1%) | -1.45% | No | No |
| SAP | 147 (1%) | 33.72% | No | No |
| SQL | 107 (1%) | -13.3% | No | No |
| Salesforce | 96 (1%) | 46.69% | No | No |
| Word Processing | 90 (1%) | -19.34% | No | No |
| Oracle | 59 (0%) | -16.26% | No | No |
| Microsoft Sharepoint | 55 (0%) | -28.61% | No | No |
| Python | 52 (0%) | 61.12% | No | No |
| Facebook | 51 (0%) | -34.28% | No | No |

| | | | | |
|---|---|---|---|---|
| Microsoft Windows | 47 (0%) | 6.61% | No | No |

## TOP 15 SKILL CLUSTERS

| Skill | Postings |
|---|---|
| Agronomy and Farming | 2623 (22%) |
| Food and Beverage Service | 1597 (13%) |
| Landscaping and Yard Care | 1504 (13%) |
| General Sales | 1305 (11%) |
| Occupational Health and Safety | 1277 (11%) |
| Budget Management | 1246 (10%) |
| Nutrition and Diet | 1193 (10%) |
| People Management | 1186 (10%) |
| Quality Assurance and Control | 1129 (9%) |

| | |
|---|---|
| Project Management | 1003 (8%) |
| Business Process and Analysis | 998 (8%) |
| Product Development | 918 (8%) |
| Biology | 750 (6%) |
| Chemistry | 718 (6%) |
| Operations Management | 708 (6%) |

## TOP 15 SALARY PREMIUM SKILLS

| Skill | Postings | Projected Growth | Salary Premium | Competitive Advantage |
|---|---|---|---|---|
| Budgeting | 1245 (10%) | -10.04% | Yes | No |
| Project Management | 865 (7%) | -19.74% | Yes | No |
| Cost Control | 668 (6%) | -6.38% | Yes | No |

## TOP 15 COMPETITIVE ADVANTAGE SKILLS

| Skill | Postings | Projected Growth | Salary Premium | Competitive Advantage |
|---|---|---|---|---|

No skills available

## TOP 15 CERTIFICATIONS

| Skill | Postings | Salary Premium | Competitive Advantage |
|---|---|---|---|
| Driver's License | 3619 (30%) | No | No |
| Pest Control Applicator | 330 (3%) | No | No |
| Registered Environmental Health Specialist | 158 (1%) | No | No |
| CDL Class A | 110 (1%) | No | No |
| Applicators License | 104 (1%) | No | No |
| Certified Pest Control | 95 (1%) | No | No |
| Global Food Safety Initiative (GFSI) | 69 (1%) | No | No |
| Commercial Pest Control Certification | 63 (1%) | No | No |
| First Aid Cpr Aed | 63 (1%) | No | No |

| | | | |
|---|---|---|---|
| Certified Crop Advisor | 59 (0%) | No | No |
| Certified Professional - Food Safety | 53 (0%) | No | No |
| Commercial Applicators License | 53 (0%) | No | No |
| Certified Arborist | 49 (0%) | No | No |
| ServSafe | 42 (0%) | No | No |
| Project Management Certification | 35 (0%) | No | No |

## TOP 15 SALARY PREMIUM CERTIFICATIONS

| Skill | Postings | Salary Premium | Competitive Advantage |
|---|---|---|---|

No certificates available

## TOP 15 COMPETITIVE ADVANTAGE CERTIFICATIONS

| Skill | Postings | Salary Premium | Competitive Advantage |
|---|---|---|---|

No certificates available

# Appendix G

## HPLS Major Curriculum Sheet

University of Kentucky

# Horticulture, Plant and Soil Sciences

## College of Agriculture, Food and Environment

The Horticulture, Plant and Soil Sciences degree program is designed to provide students with the knowledge and skills needed for a career in the production and management of plants and soils for food, fiber, forage, oil, recreation, landscaping and the enhancement of the human environment. Graduates have the technical and scientific skills as well as the communication, computational, leadership, and interpersonal capabilities necessary to function effectively as professionals. Careers are as diverse as they are challenging. Each Option prepares graduates for specific professional opportunities.

### Options

Students pursuing a Horticulture, Plant and Soil Sciences degree may choose from the following Options:

- Horticulture Enterprise Management
- Turfgrass Science
- Crops and Livestock
- Crop, Soil and Horticulture Science

### Graduation Requirements

Students must complete a minimum of 120 semester credit hours with at least 45 credit hours from courses at the 300 level or above. A 2.0 grade-point standing (on a 4.0 scale) is necessary and remedial courses may **not** be counted toward the total hours required for the degree. In addition to the UK Core and college requirements, students must select an Option with the assistance of an advisor and fulfill the area's program requirements.

### UK Core Requirements

See the *UK Core* section of the *2016-2017 Undergraduate Bulletin* for the complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required courses that also fulfill UK Core areas. Students should work closely with their advisor to complete the UK Core requirements.

#### I. Intellectual Inquiry in Arts and Creativity

Choose one course from approved list ..... 3

#### II. Intellectual Inquiry in the Humanities

Choose one course from approved list ..... 3

#### III. Intellectual Inquiry in the Social Sciences

Recommended:
CLD 102 The Dynamics of Rural Social Life ..... 3

#### IV. Intellectual Inquiry in the Natural, Physical, and Mathematical Sciences

CHE 105 General College Chemistry I ..... 4
CHE 111 Laboratory to Accompany General Chemistry I ..... 1

#### V. Composition and Communication I

CIS/WRD 110 Composition and Communication I ..... 3

#### VI. Composition and Communication II

CIS/WRD 111 Composition and Communication II ..... 3

#### VII. Quantitative Foundations

MA 123 Elementary Calculus and Its Applications ..... 4

#### VIII. Statistical Inferential Reasoning

STA 210 Making Sense of Uncertainty:
An Introduction to Statistical Reasoning ..... 3

for the **Crop, Soil and Horticulture Science Option**, students take:
STA 296 Statistical Methods and Motivations ..... 3

#### IX. Community, Culture and Citizenship in the USA

GEN 100 Issues in Agriculture, Food and Environment ..... 3

#### X. Global Dynamics

Choose one course from approved list ..... 3

**UK Core hours ..... 33**

### Graduation Composition and Communication Requirement (GCCR)

PLS 490 Topics in Plant and Soil Science ..... 3

**Subtotal: Graduation Composition and Communication hours (GCCR) ..... 3**

### Premajor Requirements

CHE 105 General College Chemistry I ..... 4
CHE 107 General College Chemistry II ..... 3
CHE 111 Laboratory to Accompany General Chemistry I ..... 1
CHE 113 Laboratory to Accompany General Chemistry II ..... 2
MA 123 Elementary Calculus and Its Applications ..... 4

**Subtotal: Premajor hours ..... 14**

Students choose one of four Options in the Horticulture, Plant and Soil Science program – Horticulture Enterprise Management; Turfgrass Science; Crops and Livestock; and Crop, Soil and Horticulture Science. All students take the Major Requirements listed below. Then, depending on their Option, take specific courses and 21 hours of Specialty Support courses, some of which may be specified. Option requirements follow Major Requirements.

### Major Requirements

PLS 104 Plants, Soils, and People: A Science Perspective ..... 3

PLS 210 The Life Processes of Plants ..... 3
**or**
*BIO 148 Introductory Biology I
**and**
*BIO 152 Principles of Biology II ..... 6

PLS 220 Introduction to Plant Identification ..... 3
PLS 366 Fundamentals of Soil Science ..... 4
PLS 386 Plant Production Systems ..... 4

PLS 395 Special Problems in Plant and Soil Science
**or**
PLS 399 Experiential Learning in Plant and Soil Science ..... 3

PLS 404 Integrated Weed Management ..... 4
PLS 470G Soil Nutrient Management ..... 3
PLS 490 Topics in Plant and Soil Science ..... 3

**Students in the Crop, Soil and Horticulture Science Option take BIO 148/152.*

**Subtotal: Major hours ..... 30-33**

– CONTINUED –

University of Kentucky is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award associate, baccalaureate, masters, and doctorate degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call 404-679-4500, or online at *www.sacscoc.org* for questions about the accreditation of University of Kentucky.

# Horticulture, Plant and Soil Sciences • 2

## Options

### Horticulture Enterprise Management Option

PLS 100 An Introduction to Horticulture Professions ..... 1
PLS 440 Plant Propagation ..... 3
PLS 525 Nursery and Floriculture Crop Production ..... 4
PPA 400G Principles of Plant Pathology ..... 3

Select **12** credit hours from the following courses:
PLS 320 Woody Horticultural Plants ..... 4
PLS 330 Herbaceous Horticultural Plants I ..... 2
PLS 332 Herbaceous Horticultural Plants II ..... 2
PLS 451 Landscape Management and Arboriculture ..... 3
PLS 515 Turf Management ..... 3
PLS 520 Fruit and Vegetable Production ..... 4
Other PLS courses with consent of advisor

**Subtotal: Option hours ..... 23**

#### Specialty Support Requirements

Select **21** hours of courses with consent of advisor ..... 21

**Subtotal: Specialty Support ..... 21**

#### Electives

Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation.

**Subtotal: Electives ..... minimum of 1**

**TOTAL HOURS: ..... 120**

### Turfgrass Science Option

PLS 514 Grass Taxonomy and Identification ..... 3
PLS 515 Turf Management ..... 3
PPA 400G Principles of Plant Pathology ..... 3

Select additional **9** credit hours of PLS courses ..... 9

**Subtotal: Option hours ..... 18**

#### Specialty Support Requirements

ENT 320 Horticultural Entomology ..... 3

CHE 226 Analytical Chemistry
**or**
CHE 236 Survey of Organic Chemistry ..... 3

Select additional **15** credit hours of specialty support in consultation with academic advisor ..... 15

**Subtotal: Specialty Support ..... 21**

#### Electives

Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation.

**Subtotal: Electives ..... minimum of 1**

**TOTAL HOURS: ..... 120**

### Crops and Livestock Option

PLS 510 Forage Management and Utilization ..... 3
Select **15** credit hours of additional PLS courses ..... 15

**Subtotal: Option hours ..... 18**

#### Specialty Support Requirements

CHE 236 Survey of Organic Chemistry ..... 3
Earn a minor in Animal Science ..... 18

### Minor in Animal Sciences

#### Prerequisites

Note that several classes in Group A and Group B have prerequisites beyond/other than ASC 101. These are indicated in parentheses following the courses below. Students taking the minor are responsible for satisfying the prerequisites.

#### Minor Requirements

ASC 101 Domestic Animal Biology ..... 3
ASC 102 Introduction to Livestock and Poultry Production ..... 3
Additional Course Work ..... 9

An additional 9 hours from the list that follows, with at least one course from Group A and one course from Group B.

**Group A**

ASC 300 Meat Science (*ASC 101 and ASC 102*) ..... 4
ASC 325 Animal Physiology (*BIO 152*) ..... 3
ASC 362 Animal Breeding and Genetics (*ASC 101 and BIO 152*) ..... 4
ASC 364 Reproductive Physiology of Farm Animals (*ASC 101 and BIO 152*) ..... 4
ASC 378 Animal Nutrition and Feeding (*ASC 101 and CHE 230 or CHE 236*) ..... 4

**Group B**

ASC 340 Poultry Production (*ASC 101 and ASC 102*) ..... 2
ASC 404G Sheep Science (*ASC 300, ASC 362, ASC 364 and ASC 378*) ..... 4
ASC 406 Beef Cattle Science (*ASC 300, ASC 362, ASC 364 and ASC 378*) ..... 4
ASC 408G Swine Production (*ASC 101, ASC 102 and ASC 378*) ..... 3
ASC 410G Equine Science (*ASC 101, ASC 320, ASC 362 and ASC 364*) ..... 3
ASC 420G Dairy Cattle Management (*ASC 362, ASC 364 and ASC 378*) ..... 3

**Total Hours Required ..... 15**

Additional specialty support classes may be selected in consultation with your academic advisor for a total of 21 hours in specialty support.

**Subtotal: Specialty Support ..... 21**

#### Electives

Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation.

**Subtotal: Electives ..... minimum of 1**

**TOTAL HOURS: ..... 120**

### Crop, Soil and Horticulture Science Option

Select **18** hours of PLS courses with consent of advisor ..... 18

**Subtotal: Option hours ..... 18**

#### Specialty Support Requirements

CHE 226 Analytical Chemistry
**or**
CHE 230 Organic Chemistry I
**or**
CHE 236 Survey of Organic Chemistry ..... 3

STA 296 Statistical Methods and Motivations ..... 3

An additional **15** credit hours of other science courses from the following list or other science courses selected with consent of advisor for a total of **21** hours:
BIO 304 Principles of Genetics ..... 4
BIO 308 General Microbiology ..... 3
BIO 315 Introduction to Cell Biology ..... 4
BIO 430G Plant Physiology ..... 4
EES 220 Principles of Physical Geology ..... 4
PHY 211 General Physics ..... 5
PHY 213 General Physics ..... 5
CHE 231 Organic Chemistry Laboratory I ..... 1
CHE 232 Organic Chemistry II ..... 3
CHE 233 Organic Chemistry Laboratory II ..... 1

**Subtotal: Specialty Support ..... 21**

#### Electives

Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation.

**Subtotal: Electives ..... minimum of 1**

**TOTAL HOURS: ..... 120**

# Appendix H

## Horticultural Science Undergraduate Program Comparison

UNIVERSITY
OF KENTUCKY College of Agriculture, Food and Environment

**Robert L. Geneve, Professor**
Department of Horticulture
401-b Plant Science Building
Lexington, Kentucky 40546-0091
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FAX: (859)257-2859
E-mail Rgeneve@uky.edu

January 23, 2019

Dr. Larry Grabau, Associate Dean for Instruction

The Horticulture, Plant and Soil Science (HPLS) undergraduate program has been a joint program between the Departments of Horticulture and Plant and Soil Science. In spring of 2018, The Department of Plant and Soil Science indicated that they would no longer formerly participate in the HPLS program. The Department of Horticulture would like to take this opportunity to propose a major program change that will focus on opportunities related to horticultural plant science as well as production and management. The proposed new name for the program will be Horticultural Science (HRT). These proposed changes have been discussed with and approved by the faculty of the Department of Plant and Soil Science (letter attached).

**A summary of the proposed PLS to HRT changes include:**

1. The name of the degree program will change from Horticulture, Plant and Soil Science to Horticultural Science.
2. Program option changes: The HRT degree program will have two options:
    a. Horticulture and Plant Science will replace the previous Crop, Soil and Horticulture Science option.
    b. Horticultural Plant Production and Management will replace the previous Enterprise Management option.
    c. Turfgrass Science and Crops and Livestock will no longer be offered as options.

Summary of program changes:

| CURRENT | PROPOSED |
|---|---|
| Degree= BS in Horticulture, Plant & Soil Science (BSHPS) | Degree = BS in Horticultural Science |
| Major= Plant and Soil Science (PSSC) | Major = Horticultural Science |
| Horticulture Enterprise Management option | Horticultural Plant Production & Management option |
| Crop, Soil & Horticulture Science option | Horticulture & Plant Science option |
| Crops & Livestock option | (DELETE OPTION |
| Turfgrass Science option | (DELETE OPTION) |

3. Pre-major requirements:
    a. The Horticulture and Plant Science option will keep the same Chemistry requirements as the former Crop, Soil and Horticulture Science option.
    b. In the Horticultural Plant Production and Management, Chemistry requirements will accept CHE 105, 107, 111, 113 or CHE 104 and 108 or CHE 105 and 108.
    c. Calculus options will expand from MA 123 to MA 123 or MA 113 or MA 137.
4. Major requirements:
    a. The Major core requirements will remain the same as the previous HPLS program with a few changes. PLS 100 Introduction the Horticultural Professions will be added and PLS 470G Soil Nutrition Management will be replaced with PLS 440 Plant Propagation.
    b. The remainder of the Major requirements will be flexible to allow students to add an additional 21 hours of PLS courses.

5. For guided electives, the Horticulture Plant Production and Management will require ENT 320 Horticultural Entomology, PPA 400G Principles Plant Pathology and 15 additional credits selected from ACC, AEC, ECO, ENT, or SAG or other prefixes by consent of advisor; the Horticulture and Plant Science option will require CHE 226 Analytical Chemistry, or CHE 230 Organic Chemistry I, or CHE 236 Survey of Organic Chemistry; STA 296 Statistical Methods and Motivations; and 15 additional credits in BIO, CHE, ENT, FOR, PPA, or other prefixes by consent of advisor.
6. Comparison of UK Bulletin information

| Current Bulletin language | Proposed Bulletin language |
|---|---|
| The Horticulture, Plant and Soil Sciences degree program is designed to provide students with the knowledge and skills needed for a career in the production and management of plants and soils for food, fiber, forage, oil, recreation, landscaping and the enhancement of the human environment. Graduates have the technical and scientific skills as well as the communication, computational, leadership, and interpersonal capabilities necessary to function effectively as professionals. Careers are as diverse as they are challenging. Each Option prepares graduates for specific professional opportunities.<br><br>Options Students pursuing a Horticulture, Plant and Soil Sciences degree may choose from the following Options: • Horticulture Enterprise Management • Turfgrass Science • Crops and Livestock • Crop, Soil and Horticulture Science | The Horticultural Science degree program is designed to provide students with the knowledge and skills needed for a career in the production and management of plants for food, recreation, landscaping and the enhancement of the human environment. Graduates have the technical and scientific skills as well as the communication, computational, leadership, and interpersonal capabilities necessary to function effectively as professionals. Careers are as diverse as they are challenging. Each Option prepares graduates for specific professional opportunities.<br><br>Options Students pursuing a Horticultural Science degree may choose from the following Options: • Horticulture and Plant Science • Horticultural Plant Production and Management |

| | |
|---|---|
| Graduation Composition and Communication Requirement (GCCR)<br>Graduation Composition and Communication Requirement (GCCR) PLS 490 Topics in Plant and Soil Science.....3<br>Subtotal: Graduation Composition and Communication hours (GCCR) .....3 | Graduation Composition and Communication Requirement (GCCR)<br>Graduation Composition and Communication Requirement (GCCR) PLS 490 Topics in Plant and Soil Science..... 3<br>Subtotal: Graduation Composition and Communication hours (GCCR)..... 3 |

| | |
|---|---|
| In addition, the student must submit a proposed plan of study for the junior and senior years.<br><br>Premajor Requirements Hours<br>CHE 105 General College Chemistry I .....4<br>CHE 107 General College Chemistry II .....3<br>CHE 111 General Chemistry I Laboratory.....1<br>CHE 113 General Chemistry II Laboratory.....2<br>MA 123 Elementary Calculus and Its Applications .....4<br>Subtotal: Premajor hours..... 14<br><br>Students choose one of four Options in the Horticulture, Plant and Soil Science program – Horticulture Enterprise Management; Turfgrass Science; Crops and Livestock; and Crop, Soil and Horticulture Science. All students take the Major Requirements listed below. Then, depending on their Option, take specific courses and 21 hours of Specialty Support courses, some of which may be specified. Option requirements follow Major Requirements.<br><br>Major Requirements Hours<br><br>PLS 104 Plants, Soils, and People: A Science Perspective....3<br>PLS 210 The Life Processes of Plants...3<br>or<br>*BIO 148 Introductory Biology I<br>and *BIO 152 Principles of Biology II.....6<br>PLS 220 Introduction to Plant Identification.... 3<br>PLS 366 Fundamentals of Soil Science .... 4<br>PLS 386 Plant Production Systems..... 4<br>PLS 395 Special Problems in Plant and Soil Science or PLS<br>399 Experiential Learning in Plant and Soil Science .....3<br>PLS 404 Integrated Weed Management.... 4<br>PLS 470G Soil Nutrient Management .....3<br>PLS 490 Topics in Plant and Soil Science... 3 | In addition, the student must submit a proposed plan of study for the junior and senior years.<br><br>Premajor Requirements Hours<br><u>Calculus (complete one)</u><br>MA 123 Elementary Calculus and Its Applications……4<br>Or<br>MA 113 Calculus I……4<br>Or<br>MA 137 Calculus I with Life Sciences Applications……4<br><br><u>Chemistry (complete one sequence)</u><br>CHE 105 General College Chemistry I.....4<br>CHE 107 General College Chemistry II.....3<br>CHE 111 General Chemistry I Laboratory..... 1<br>CHE 113 General Chemistry II Laboratory..... 2<br>or<br>*CHE 104 Introduction to General Chemistry.... 3<br>*CHE 108 Introduction to Inorganic, Organic and Biochemistry..... 3<br>Or<br>*CHE 105 General College Chemistry I……..4<br>*CHE 108 Introduction to Inorganic, Organic, and Biochemistry……..3<br><br>* Fulfills chemistry requirement for students in the Horticultural Plant Production and Management option only.<br>Subtotal : Premajor hours .....10 to 14<br><br>Students choose between the Horticulture & Plant Science option and the Horticultural Plant Production and Management option. All students take the same Major Core requirements listed below, but each option has a separate section of PLS 490 Topics in Horticultural Plant Science.<br><br>Major Requirements Hours<br>PLS 100 Introduction to Horticultural Professions ..... 1<br>PLS 104 Plants, Soils, and People: A Science Perspective... 3<br>PLS 210 The Life Processes of Plants.. 3<br>or<br>*BIO 148 Introductory Biology I<br>and *BIO 152 Principles of Biology II.....6<br><br>PLS 220 Introduction to Plant Identification.... 3<br>PLS 366 Fundamentals of Soil Science ....4 |

| | |
|---|---|
| | PLS 386 Plant Production Systems ..... 4<br><br>PLS 395 Special Problems in Plant and Soil Science<br>or<br>PLS 399 Experiential Learning in Plant and Soil Science……3<br><br>PLS 404 Integrated Weed Management. ... 4<br>PLS 440 Plant Propagation .....3<br>PLS 490 Topics in Plant and Soil Science ... 3 |
| *Students in the Crop, Soil and Horticulture Science Option take BIO 148/152.<br>Subtotal: Major hours ..... 30-33 | *Students in the Horticulture & Plant Science Option take BIO 148/152.<br>Subtotal: Major hours .....31-34 |

| | |
|---|---|
| **Crop, Soil and Horticulture Science Option**<br><br>Select 18 hours of PLS courses with consent of advisor<br>Subtotal: Option hours.....18<br><br>Specialty Support Requirements<br>CHE 226 Analytical Chemistry<br>or<br>CHE 230 Organic Chemistry I<br>or<br>CHE 236 Survey of Organic Chemistry……3<br>STA 296 Statistical Methods & Motivations.3<br><br>An additional 15 credit hours of other science courses from the following list or other science courses selected with consent of advisor for a total of 21 hours:<br>BIO 304 Principles of Genetics ..... 4<br>BIO 308 General Microbiology.. 3<br>BIO 315 Introduction to Cell Biology...4<br>BIO 430G Plant Physiology..... 4<br>EES 220 Principles of Physical Geology ..... 4<br>PHY 211 General Physics..... 5<br>PHY 213 General Physics..... 5<br>CHE 231 Organic Chemistry Laboratory I... 1<br>CHE 232 Organic Chemistry II .....3<br>CHE 233 Organic Chemistry Laboratory II.... 1<br>Subtotal: Specialty Support.....21<br><br>Electives Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation. | **Horticulture & Plant Science option**<br><br>Select 21 hours of PLS courses with consent of advisor<br>Subtotal: Option hours……..21<br><br>Specialty Support Requirements<br>CHE 226 Analytical Chemistry<br>or<br>CHE 230 Organic Chemistry I<br>or<br>CHE 236 Survey of Organic Chemistry…3<br><br>STA 296 Statistical Methods & Motivations.3<br><br>An additional 15 credit hours of other science courses from the following BIO, CHE, ENT, PPA, FOR, or other science courses selected with consent of advisor for a total of 21 hours:<br>Subtotal: Specialty Support.. ..... 21<br><br>Electives Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation. |
| **Horticulture Enterprise Management Option**<br><br>PLS 100 An Introduction to Horticulture Professions..... 1<br>PLS 440 Plant Propagation ..... 3<br>PLS 525 Nursery and Floriculture Crop Production .....4<br>PPA 400G Principles of Plant Pathology....3<br>Select 12 credit hours from the following courses:<br>PLS 320 Woody Horticultural Plants .. 4<br>PLS 330 Herbaceous Horticultural Plants I.....2<br>PLS 332 Herbaceous Horticultural Plants II..... 2<br>PLS 451 Landscape Management and Arboriculture..... 3<br>PLS 515 Turf Management..... 3 | **Horticultural Plant Production and Management Option**<br><br>Select 21 hours of PLS courses with consent of advisor<br>Subtotal: Option hours…… 21 |

| | |
|---|---|
| PLS 520 Fruit and Vegetable Production.....4<br>Other PLS courses with consent of advisor<br>Subtotal: Option hours.....23<br><br>Specialty Support Requirements<br>Select 21 hours of courses with consent of advisor..... ……21<br>Subtotal: Specialty Support 21<br><br>Electives - Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation. | Specialty Support Requirements<br>ENT 320 Horticultural Entomology ..... 3<br>PPA 400G Principles Plant Pathology ....3<br>An additional 15 credit hours other courses in SAG, AEC, ECO, ACC, ENT or consent of advisor.<br><br>Subtotal: Specialty Support……21<br><br>Electives - Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation. |
| **Turfgrass Science option** | **Deleted** |
| **Crops and Livestock option** | **Deleted** |

R Geneve

Robert Geneve, Professor

*PLEASE NOTE: To ensure that a series of changes to an existing degree program does not essentially create a new program, the Southern Association for the Accreditation of Colleges and Schools (SACS) requires submission of its Substantive Change Checklist for every program change. Prior to college-level review, you must fill out and submit the SACS Substantive Change Checklist to the Office of Institutional Effectiveness. Contact Institutional Effectiveness (OSPIE@uky.edu) for assistance.*

*Once approved at the college level, your college will send the proposal to the appropriate Senate academic council (HCCC and/or UC) for review and approval. Once approved at the academic council level, the academic council will send your proposal to the Senate Council office for additional review and then a 10-day posting online, during which senators review on their own and have an option to register an objection if they so desire. If no objection is raised to the Senate Council Office within ten days of the posting the proposal, then the program change is approved. The Senate Council*

For every proposed change, you MUST also include the existing requirement.

| **SUMMARY OF CHANGES** | | | |
|---|---|---|---|
| **Check all that apply.** | | | |
| ☒ Courses | ☒ Program name | Total required credit hours | Student learning outcomes |
| Criteria for admissions/progression/termination | Certificate assessment | Other | |

## 1. General Information

| | | | | |
|---|---|---|---|---|
| 1a | Date of contact with Institutional Effectiveness (IE)[1] : | 02/19/19 | | |
| | X☒x Appended to the end of this form is a PDF of the reply from Institutional Effectiveness. | | | |
| 1b | College[2]: | College of Agriculture, Food and Environment | Department[2]: | Department of Horticulture |
| 1c | CIP code[3]: | 01.1102 | Today's Date: | 10/01/2018 |
| 1d | Current major name: (Biology, Design, etc.) | Plant and Soil Science | *Proposed major name:* | *Horticultural Science* |
| 1e | Current Degree (BA, BFA, etc.): | BS in Horticulture Plant and Soil Science | *Proposed degree:* | BS in Horticultural Science |
| 1f | Will there be any changes regarding a track(s) for the program? | Yes ☒ | No ☐ | |
| 1g | Accrediting agency, if applicable: | none | | |
| 1h | Date of most recent periodic program review for this degree: | 2017 | | |

[1] Prior to college-level review, you must fill out and submit the SACS Substantive Change Checklist to the Office of Institutional Effectiveness. You can reach Institutional Effectiveness by phone or email (257-1962 or OSPIE@uky.edu).
[2] It is not possible to change the home academic unit of a degree program via this form. To change the home unit, visit https://www.uky.edu/universitysenate/forms and look for the heading, "Forms Related to Academic Organizational Structure."
[3] The CIP code is provided by Institutional Effectiveness. If a different CIP code is necessary, the program may undergo a review similar to the new program approval process.

| | | | | | |
|---|---|---|---|---|---|
| 1i | Requested effective date: | ☒ Fall semester following approval. | OR | ☐ Specific Date[4]: *Fall 20* | |
| | | | | | |
| 1j | Contact person name: | Robert Geneve | Phone / Email: | 257-8610 / rgeneve@uky.edu | |

**2. Overview of Changes**

| | |
|---|---|
| 2a | Describe the rationale for the changes, including results from the most recent program review if applicable. (*450 word limit*) |
| | The Horticulture, Plant and Soil Science (HPLS) undergraduate program has been a joint program between the Departments of Horticulture and Plant and Soil Science. In spring of 2018, Following the recent program review, the Department of Plant and Soil Science indicated that they would no longer formerly participate in the HPLS program. The Department of Horticulture would like to take this opportunity to propose a major program change that will focus on opportunities related to horticultural plant science as well as production and management. The proposed new name for the program will be Horticultural Science (HRT) and the proposed prefix for courses taught by Department of Horticulture faculty will change from PLS to HRT. Courses taught by the Department of Plant and Soil Science faculty will remain as PLS. These proposed changes have been discussed with and approved by the Chair of the Department of Plant and Soil Science. In addition, the new HRT program will have only two options (tracks) rather than the current four in HPLS. |

| | | | | |
|---|---|---|---|---|
| 2b | Use the fields below, as applicable, to identify the areas in which changes will be made. | | | |
| | | | Current | *Proposed* |
| i. | Credit Hours of Premajor Courses: | | 14 | *10-14* |
| ii. | Credit Hours of Preprofessional Courses: | | | |
| iii. | Credit Hours of Major Core Course Requirements | | 30-33 | *31-34* |
| iv. | Minimum Credit Hours of Guided Electives: | | 21 | *21* |
| v. | Minimum Credit Hours of Free Electives: | | 1 | *1* |
| vi. | Credit Hours for Track 1 (name):<br>From-Horticulture Enterprise Management;<br>To - Horticultural Plant Production and Management | | 23 | *21* |
| vii. | Credit Hours for Track 2 (name):<br>From- Crops, Soils and Horticulture Science<br>To - Horticulture and Plant Science | | 18 | *21* |
| viii. | Credit Hours for Track 3 (name): | | | |
| ix. | Credit Hours for Track 4 (name): | | | |
| x. | Credit Hours for Track 5 (name): | | | |
| xi. | Credit Hours for Required Minor: | | | |
| xii. | Total Credit Hours Required by Level: | 100-level: | 36-42 | *30-42* |
| | | 200-level: | 9-15 | *9-15* |
| | | 300-level: | 9-18 | *9-18* |
| | | 400-level: | 9-12 | *9-12* |
| | | 500-level: | 10-23 | *10-23* |
| | | | | |
| | TOTAL CREDIT HOURS REQUIRED FOR GRADUATION: | | 120 | *120* |
| | | | | |
| xv. | If the total hours required for graduation have changed, explain below. (*150 word limit*) | | | |
| | | | | |

[8] Use the drop-down list to indicate if the course is new, exists but will change, or exists but will not change.

[4] No program change(s) will be effective until all approvals are received.

| | | | |
|---|---|---|---|
| 2c | Will the requested change(s) result in the use of courses from another educational unit? | Yes ☒ | No |
| | If "Yes," describe generally the courses and how they will used. | | |
| | There would be no new courses required in the proposed program. The HRT program would continue to use the PLS courses previously required in the HPLS degree offered by the Department of Plant and Soil Science. | | |
| | If "Yes," two pieces of supporting documentation are required.<br><br>☒ Check to confirm that appended to the end of this form is a letter of support from the appropriate chair/director[5] of each unit from which individual courses will be used.<br><br>☒ Check to confirm that appended to the end of this form is verification that the chair/director of each affected unit has consent from the faculty members of the unit. This typically takes the form of meeting minutes. | | |
| 2d | Will the proposed change(s) affect an associated minor? | Yes | No ☒ |
| | If "Yes," the department must also submit a change form to change the minor. | | |

**3. UK Core Courses**

| | | | |
|---|---|---|---|
| 3a | Are there any proposed changes to the UK Core requirements for the program? (If "Yes," indicate and proceed to next question. If "No," indicate and proceed to 4a.) | Yes ☒ | No |
| | If "Yes," note the specific changes in the grid below. | | |

| **UK Core Area** | Current Course | Current Credits | *Proposed Course* | *Proposed Credits* |
|---|---|---|---|---|
| I. Intellectual Inquiry | | | | |
| Arts and Creativity | | | | |
| Humanities | | | | |
| Social Sciences | | | | |
| Natural/Physical/Mathematical | CHE 105/111 | *5* | *PLS 104* | *3* |
| II. Composition and Communication | | | | |
| Composition and Communication I | CIS/WRD 110 | 3 | *CIS/WRD 110* | *3* |
| Composition and Communication II | CIS/WRD 111 | 3 | *CIS/WRD 111* | *3* |
| III. Quantitative Reasoning | | | | |
| Quantitative Foundations | | | | |
| Statistical Inferential Reasoning | | | | |
| IV. Citizenship (one course in each area) | | | | |
| Community, Culture & Citizenship in USA | | | | |
| Global Dynamics | | | | |
| **Total UK Core Hours** | | **33** | | *31* |

| | |
|---|---|
| 3b | Provide the Bulletin language about UK Core. |

[9] Use the drop-down list to indicate if the course is new, exists but will change, or exists but will not change.

| | |
|---|---|
| | **See the UK Core section of the Undergraduate Bulletin for complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required program courses that also fulfill UK Core areas.Students should work closely with their advisor to complete the UK Core requirements.**<br>**I. Intellectual Inquiry in Arts and Creativity**<br>**Choose on course from approved list.....3**<br>**II. Intellectual Inquiry in the Humanities**<br>**Choose on course from approved list.....3**<br>**III. Intellectual Inquiry in Social Sciences**<br>**Recommended:**<br>**CLD 102 The Dynamics of Rural Social Life..... 3**<br>**IV. Intellectual Inquiry in the Natual, Physical, and Mathematical Sciences**<br>**PLS 104 Plants, Soils, and People: A Science Perspective ..... 3**<br>**V. Composition and Communication I**<br>**CIS/WRD 110 Composition and Communication.....3**<br>**VI. Composition and Communication II**<br>**CIS/WRD 111 Composition and Communication.....3**<br>**VII. Quantitative Foundations**<br>**MA 123 Elementary Calculus and Its Applications ..... 4**<br>**VIII. Statistical Inferential Reasoning**<br>**STA 210 Making Sense of Uncertainty.....3**<br>**or STA 296 Statistical Methods and Motivations .....3**<br>**IX. Community, Culture and Citizenship in the USA**<br>**GEN 100 Issues in Agriculture, Food and Environment..... 3**<br>**X. Global Dynamics**<br>**Choose on course from approved list.....3**<br>**UK Core hours.....31** |

**4. Graduation Composition and Communication Requirement**

| | | | |
|---|---|---|---|
| 4a | Will the Graduation Composition and Communication requirement be changed? (If "Yes," indicate and proceed to next question. If "No," indicate and proceed to 5a.) | Yes ☐ | No ☒ |

If "Yes," note the specific changes below, including changes to credit hours.

If the course(s) used are from outside the home unit, one piece of supporting documentation is required.

☐ Check to confirm that appended to the end of this form is a letter of support from the other units' chair/director[6] from which individual courses will be used.

| | ☐ Current | *Proposed* |
|---|---|---|
| i. | ☐ Single course in home unit: | *Single course in home unit:* |
| ii. | ☐ Multiple courses in home unit. | *Multiple courses in home unit.* |
| iii. | ☐ Single course outside home unit. | *Single course outside home unit.* |
| iv. | ☐ Multiple courses outside home unit. | *Multiple courses outside home unit.* |
| v. | Course(s) inside & outside home unit. | *Course(s) inside & outside home unit.* |

| | |
|---|---|
| 4b | Provide the Bulletin language about GCCR below. |

**5. Other Course Changes**

| | | | |
|---|---|---|---|
| 5a | Will the college-level requirements change? (If "Yes," indicate and note the specific | Yes | No ☒ |

[10] Use the drop-down list to indicate if the course is new, exists but will change, or exists but will not

| | | | |
|---|---|---|---|
| | changes in the grid below. If "No," indicate and proceed to question 5c.) | | |

| Current | | | *Proposed* | | | |
|---|---|---|---|---|---|---|
| | ☐ Standard college requirement | | *Standard college requirement* | | | |
| | ☐ Specific course | | *Specific course* | | | |
| Prefix & Nmbr | Credit Hrs | Title | *Prefix & Nmbr* | *Credit Hrs* | *Title* | *Course Status*[7] |
| | | | | | | Select one.... |
| | | | | | | Select one.... |
| | | | | | | Select one.... |

| | | | |
|---|---|---|---|
| 5b | Will the existing language in the Bulletin about college-level requirements change? | Yes | No ☒ |
| | If "Yes," provide the new language below. | | |
| | | | |

| | | | |
|---|---|---|---|
| 5c | Will the pre-major or pre-professional course requirements change? (If "Yes," indicate and note the specific changes in the grid below. If "No," indicate and proceed to question 5e.) | Yes ☒ | No ☐ |

| Current | | | *Proposed* | | | |
|---|---|---|---|---|---|---|
| Prefix & Nmbr | Credit Hrs | Title | *Prefix & Nmbr* | *Credit Hrs* | *Title* | *Course Status*[8] |
| CHE 105 | 4 | General College Chemistry I | CHE 105 | 4 | General College Chemistry I | No Change |
| CHE 107 | 3 | General College Chemistry II | CHE 107 | 3 | General College Chemistry II | No Change |
| CHE 111 | 1 | Laboratory to Accompany General Chemistry I | CHE111 | 1 | General Chemistry Lab I | No Change |
| CHE 113 | 2 | Laboratory to Accompany General Chemistry I I | CHE 113 | 2 | General Chemistry Lab II | No Change |
| MA 123 | 4 | Elementary Calculus | CHE 104 | 3 | Introduction to General Chemistry | No Change |
| | | | CHE 108 | 3 | Introduction to Inorganic, Organic and Biochemistry Without Lab | No Change |
| | | | MA 123 | 4 | Elementary Calculus & Its Applications | No Change |
| | | | MA 113 | 4 | Calculus I | No Change |
| | | | MA 137 | 4 | Calculus I with Life Science Applications | No Change |
| | | | | | | |

[11] Use the drop-down list to indicate if the course is new, exists but will change, or exists but will not

| 5d | Provide the Bulletin language about pre-major or pre-professional courses below. |
|---|---|
| | Premajor Requirements Hours<br>Calculus (complete one )<br>MA 123 Elementary Calculus and Its Applications……..4<br>Or MA 113 Calculus I…… 4<br>Or MA 137 Calculus I with Life Sciences ……4<br><br>Chemistry (complete one sequence)<br>CHE 105 General College Chemistry I..... 4<br>CHE 107 General College Chemistry II .....3<br>CHE 111 General College Chemistry Lab I.....1<br>CHE 113 General College Chemistry Lab I .....2<br>Or<br>*CHE 104 Introduction to General Chemistry.....3<br>*CHE 108 Introduction to Inorganic, Organic and Biochemistry w/out Lab .....3<br>Or<br>*CHE 105 General College Chemistry I…….……..4<br>*CHE 108 Intro to Inorganic, Organic and Biochemistry w/out…..……... 3<br>* Sequence fulfills chemistry requirement for students in the Horticultural Plant Production and Management option only.<br><br>Subtotal : Premajor hours ……10 to 14 |

[7] Use the drop-down list to indicate if the course is a new course ("new"), an existing course that will change ("change"), or if the course is an existing course that will not change ("no change").

[12] Use the drop-down list to indicate if the course is new, exists but will change, or exists but will not

| | | | |
|---|---|---|---|
| | | | |
| 5e | Will the major's core course requirements change? (If "Yes," indicate and note the specific changes in the grid below. If "No," indicate and proceed to question 5g.) | Yes ☒ | No ☐ |
| | If "Yes," note the specific changes in the grid below. | | |

| Current | | | *Proposed* | | | |
|---|---|---|---|---|---|---|
| Prefix & Nmbr | Credit Hrs | Title | *Prefix & Nmbr* | *Credit Hrs* | *Title* | *Course Status*[9] |
| PLS 104 | 3 | Plants, Soils, and People | PLS 100 | 3 | Introduction to Horticultural Professions | No Change |
| PLS 210 | 3 | The Life Processes of Plants | PLS 104 | 3 | Plants, Soils, and People | No Change |
| Bio 148 Bio 152 | 6 | Introdutory Biology I and II | PLS 210 | 3 | The Life Processes of Plants | No Change |
| PLS 220 | 3 | Introduction to Plant Identification | Bio 148 Bio 152 | 6 | Introductory Biology I and II | No Change |
| PLS 366 | 4 | Fundamentals of Soil Science | PLS 220 | 3 | Introduction to Plant Identification | No Change |
| PLS 386 | 4 | Plant Production Systems | PLS 366 | 4 | Fundamentals of Soil Science | No Change |
| PLS 399 | 3 | Experential Learning in PLS | PLS 386 | 4 | Plant Production Systems | No Change |
| PLS 404 | 3 | Integrated Weed Management | PLS 399 | 3 | Experiential Learning in PLS | No Change |
| PLS 470G | 3 | Soil Nutrition Management | PLS 404 | 3 | Integrated Weed Management | No Change |
| PLS 490 | 3 | Topics in Plant and Soil Science | PLS 440 | 3 | Plant Propagation | No Change |
| | | | PLS 490 | 3 | Topics in Plant and Soil Science | No Change |
| | | | PLS 395 | 3 | Special Problems in Plant & Soil Science | No Change |
| | | | | | | Select one.... |
| | | | | | | Select one.... |
| | | | | | | Select one.... |

| | |
|---|---|
| 5f | Provide the Bulletin language for major core course requirements. |
| | Students choose between the Horticultural Science option and the Horticultural Plant Production and Management option. All students take the same Major Core requirements listed below, but each option has a separate section of PLS 490 Topics in Plant and Soil Science.<br>Major Requirements<br>PLS 100 Introduction to Horticultural Professions ..... 1<br>PLS 104 Plants, Soils, and People: A Science Perspective ..... 3<br>PLS 210 The Life Processes of Plants..... 3<br>or<br>*Bio 148 and Bio 152 Introductory Biology I and Principles of Biology II ..... 6 |

[9] Use the drop-down list to indicate if the course is new, exists but will change, or exists but will not change.

PLS 220 Introduction to Plant Identification.....3
PLS 366 Fundamentals of Soil Science .....4
PLS 386 Plant Production Systems..... 4
PLS 395 Special Problems in Plant and Soil Science
OR
PLS 399 Experiential Learning in Plant and Soil Science .....3
PLS 404 Integrated Weed Management.....4
PLS 440 Plant Propagation..... 3
PLS 490 Topics in Plant and Soil Science..... 3
* Students in the Horticulture and Plant Science option take Bio 148/152
Subtotal : Major hours.....31 to 34

☐

| 5g | Will the guided electives change? (If "Yes," indicate and note the specific changes in the grid below. If "No," indicate and proceed to question 5i.) | Yes ☒ | No |
|---|---|---|---|

| Current | | | *Proposed* | | | |
|---|---|---|---|---|---|---|
| Prefix & Nmbr | Credit Hrs | Title | *Prefix & Nmbr* | *Credit Hrs* | *Title* | *Course Status[10]* |
| CHE 226 | 3 | Analytical Chemistry | ENT 320 | 3 | Horticultural Entomology | No Change |
| CHE 230 | 3 | Organic Chemistry I | PPA 400G | 3 | Principles of Plant Pathology | No Change |
| CHE 236 | 3 | Survey of Organic Chemistry | CHE 236 | 3 | Survey of Organic Chemistry | No Change |
| | | | CHE 230 | 3 | Organic Chemistry I | No Change |
| | | | CHE 226 | 3 | Analytical Chemistry | No Change |
| STA 296 | 3 | Statistical Methods | STA 296 | 3 | Statistical Methods | No Change |
| | | | | | | Select one.... |
| | | | | | | Select one.... |

| 5h | Provide the Bulletin language for guided electives. |
|---|---|

Students choose guided electives based on chosen option (Horticulture and Plant Science OR Horticultural Plant Production and Management).

Select 21 hours of PLS courses with consent of advisor for option
Subtotal: Option hours.....21

Specialty Support Requirement
**Horticulture and Plant Science option:**
CHE 236 Survey of Organic Chemistry
or
CHE 230 Organic Chemistry I
or
CHE 226 Analytical Chemistry .....3
STA 296 Statistical Methods and Motivations..... 3
Additional courses in BIO, CHE, PPA, ENT, FOR or consent of advisor .....15
Subtotal for Specialty Support..... 21

☐

**Horticultural Plant Production and Management option:**

| | |
|---|---|
| ENT 320 Horticultural Entomology | 3 |
| PPA 400G Principles Plant Pathology | 3 |
| Additional courses in SAG, AEC, ECO, ACC, ENT or consent of advisor | 15 |
| Subtotal for Specialty Support | 21 |

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| | | | |
|---|---|---|---|
| 5i | Will the free electives change? (If "Yes," indicate and note the specific changes in the space below. If "No," indicate and proceed to question 5j.) | Yes | No ☒ |

| | | | |
|---|---|---|---|
| 5j | Does the proposed change affect any track(s)? (If "Yes," note the specific changes using the grid below. If "No," proceed to question 6.) | Yes ☒ | No |
| | If more than one track is affected, click HERE for a template. Append a PDF for each affected track to the end of this form. | | |

| Track Name: | Crops and Livestock<br>Turfgrass Science | New Track | Changed Track | Deleted Track |
|---|---|---|---|---|

| Current | | | *Proposed* | | | |
|---|---|---|---|---|---|---|
| Prefix & Nmbr | Credit Hrs | Title | *Prefix & Nmbr* | *Credit Hrs* | *Title* | *Course Status*[11] |
| | | | | | | Select one.... |
| | | | | | | Select one.... |
| | | | | | | Select one.... |
| | | | | | | Select one.... |
| | | | | | | Select one.... |
| | | | | | | Select one.... |

| | |
|---|---|
| 5k | Provide the Bulletin language for the track. |

**6. Semester by Semester Program**

List below the typical semester-by-semester program for the major. If multiple tracks are available, click HERE for a template for additional tracks and append a PDF of each track's courses to the end of this form.

| | | | |
|---|---|---|---|
| **YEAR 1 – FALL:**<br>(e.g. "BIO 103; 3 credits") | | **YEAR 1 – SPRING:** | |
| **YEAR 2 - FALL :** | | **YEAR 2 – SPRING:** | |
| **YEAR 3 - FALL:** | | **YEAR 3 - SPRING:** | |

| | | | |
|---|---|---|---|
| **YEAR 4 - FALL:** | | **YEAR 4 - SPRING:** | |

## 7. Approvals/Reviews

Information below does not supersede the requirement for individual letters of support from educational unit administrators and verification of faculty support (typically takes the form of meeting minutes).

*In addition to the information below, attach documentation of department and college approval. This typically takes the form of meeting minutes but may also be an email from the unit head reporting department- and college-level votes.*

| | Reviewing Group Name | Date Approved | Contact Person Name/Phone/Email |
|---|---|---|---|
| 7a | (Within College) | | |
| | Horticulture Department | 9/28/18 | **Mark Williams/7-2638/Mark.Williams@uky.edu** |
| | Undergraduate Curriculum Committee, CAFE | 1/25/19 | **Larry J. Grabau/7-3468/lgrabau@uky.edu** |
| | | | **/ /** |
| | | | **/ /** |

| | | | |
|---|---|---|---|
| 7b | (Collaborating and/or Affected Units) | | |
| | Plant and Soil Sciences Department | 9/18/18 | **Rebecca McCulley/7-6388/Rebecca.McCulley@uky.edu** |
| | | | **/ /** |
| | | | **/ /** |
| | | | **/ /** |
| | | | **/ /** |

| | | | |
|---|---|---|---|
| 7c | (Senate Academic Council) | **Date Approved** | **Contact Person Name** |
| | Health Care Colleges Council (if applicable) | | |
| | Undergraduate Council | | |

**TEMPLATE FOR ADDITIONAL TRACKS, *SEMESTER-BY-SEMESTER PROGRAM OF STUDY***
**PROPOSAL TO CHANGE *UNDERGRADUATE* DEGREE PROGRAM**

**6. Semester by Semester Program**

List below the typical semester-by-semester program of study, e.g. "GWS 200; 3 credits," for a track in the program. Convert this addendum to a PDF and append to the end of the PROPOSAL TO CHANGE UNDERGRADUATE DEGREE PROGRAM form.

Track Name: **Horticulture and Plant Science option**

| | | | |
|---|---|---|---|
| **YEAR 1 - FALL:** | CIS/WRD 110 Comp & Comm I 3<br>GEN 100 Current Issues in Ag, Food & Env 3<br>MA 123 Elementary Calculus 4<br>CHE 105 General ChemistryII 4<br>CHE 111 General Chem Lab I 1<br>PLS 100 Intro to Hort Professions 1<br>Total 16 | **YEAR 1 - SPRING:** | *CIS/WRD 111 Comp & Comm II 3*<br>*CLD 102 Dynamics of Rural Social Life 3*<br>*PLS 104 Plants, Soils & People: A Science Perspective 3*<br>*BIO 148 Principles of Biology 3*<br>*UK Core Humanities 3*<br>*Total 15 hr* |
| **YEAR 2 - FALL :** | BIO 152 Principles of Biology II 3<br>PLS 220 Intro to Plant Identification 3<br>PLS 386 Plant Production Systems 4<br>STA 296 Statistical Methods and Motivations 3<br>UK Core Global Dynamics 3<br>Total 16 hr | **YEAR 2 - SPRING:** | *CHE 107 General Chemistry II 3*<br>*CHE 113 General Chem Lab II 2*<br>*PLS 366 Fundamentals of Soil Science 4*<br>*UK Core Arts & Creativity 3*<br>*Specialty Support 3*<br>*Total 15 hr* |
| **YEAR 3 - FALL:** | PLS Course (rec-PLS 210 Life Processes of Plants) 3<br>PLS Course 3<br>CHE 236 Survey of Organic Chem 3<br>Specialty Support 3<br>Elective 3<br>Total 15 hr | **YEAR 3 - SPRING:** | *PLS 440 Plant Propagation 3*<br>*PLS Course 3*<br>*PLS Course 3*<br>*Specialty Support 3*<br>*Specialty Support 3*<br>*Total 15 hr* |
| **YEAR 4 - FALL:** | PLS 399 Experiential Learning in PLS 3<br>PLS 490 Topics in PLS 3<br>Specialty Support 3<br>Specialty Support 3<br>Elective 3<br>Total 15 hr | **YEAR 4 - SPRING:** | *PLS 404 Integrated Weed Management 4*<br>*PLS Course 3*<br>*PLS course 3*<br>*PLS course 3*<br>*Total 13 hr* |

**TEMPLATE FOR ADDITIONAL TRACKS, *SEMESTER-BY-SEMESTER PROGRAM OF STUDY***
**PROPOSAL TO CHANGE *UNDERGRADUATE* DEGREE PROGRAM**

| | | | |
|---|---|---|---|
| Track Name*:* **Horticultural Plant Production and Management option** | | | |
| **YEAR 1 - FALL:** | CIS/WRD 110 Comp & Comm I 3<br>GEN 100 Current Issues in Ag, Food & Env 3<br>MA 123 Elementary Calculus 4<br>PLS 100 Intro to Hort Professions 1<br>UK Core Arts & Creativity 3<br>Total 14 | **YEAR 1 - SPRING:** | *CIS/WRD 111 Comp & Comm II 3*<br>*STA 210 Intro to Stat Reasoning 3*<br>*PLS 104 Plants, Soils & People: A Science Perspective 3*<br>*UK Core Humanities 3*<br>*CLD 102 Dynamics of Rural Social Life 3*<br>*Total 15 hr* |
| **YEAR 2 - FALL :** | CHE 104Intro General Chemistry 3<br>PLS 210 Life Processes of Plants 3<br>PLS 220 Intro to Plant Identification 3<br>PLS 386 Plant Production Systems 4<br>Specialty Support 3<br>Total 16 hr | **YEAR 2 - SPRING:** | *CHE 108Intro Inorganic, Organic Chemistry 3*<br>*PLS 366 Fundamentals of Soil Science 4*<br>*PLS Course 3*<br>*PLS Course 3*<br>*UK Core Global Dynamics 3*<br>*Total 16 hr* |
| **YEAR 3 - FALL:** | PLS Course 3<br>PLS Course 3<br>Specialty Support 3<br>ENT 320 3<br>Electives 3<br>Total 15 hr | **YEAR 3 - SPRING:** | *PLS 440 Plant Propagation 3*<br>*PLS course –(rec:PLS 520 Fruit & Vegetable Production 4)*<br>*PLS Course 3*<br>*Specialty Support 3*<br>*Specialty Support 3*<br>*Total 16 hr* |
| **YEAR 4 - FALL:** | PLS 399 Experiential Learning in PLS 3<br>PLS 490 Topics in PLS 3<br>PPA 400G Principles of Plant Pathology 3<br>Specialty Support 3<br>Electives 3<br>Total 15 hr | **YEAR 4 - SPRING:** | *PLS 404 Integrated Weed Management 4*<br>*PLS course - 3*<br>*Electives 3*<br>*Electives 3*<br>*Total 13 hr* |
| | | | |
| Track Name*:* _____ | | | |
| **YEAR 1 - FALL:** | _____ | **YEAR 1 - SPRING:** | _____ |
| **YEAR 2 - FALL :** | _____ | **YEAR 2 - SPRING:** | _____ |
| **YEAR 3 - FALL:** | _____ | **YEAR 3 - SPRING:** | _____ |
| **YEAR 4 - FALL:** | _____ | **YEAR 4 - SPRING:** | _____ |
| | | | |
| Track Name: _____ | | | |
| **YEAR 1 - FALL:** | _____ | **YEAR 1 - SPRING:** | _____ |
| **YEAR 2 - FALL :** | _____ | **YEAR 2 - SPRING:** | _____ |
| **YEAR 3 - FALL:** | _____ | **YEAR 3 - SPRING:** | _____ |

**TEMPLATE FOR ADDITIONAL TRACKS, *SEMESTER-BY-SEMESTER PROGRAM OF STUDY***
**PROPOSAL TO CHANGE *UNDERGRADUATE* DEGREE PROGRAM**

| **YEAR 4 - FALL:** | _____ | **YEAR 4 - SPRING:** | _____ |
|---|---|---|---|
| | | | |

**UNIVERSITY OF KENTUCKY**

**College of Agriculture, Food and Environement**

***Mark A. Williams, Ph.D.,***
***Professor and Chair***
*DEPARTMENT OF HORTICULTURE*
*N-318-F Agricultural Science Building-North*
*Lexington, Kentucky 40546-0091*
*Office: (859) 257-1758  Fax: (859) 257-2859*
*e-mail: mark.williams@uky.edu*

September 28, 2018

Dear Curriculum Review Committee,

This letter is in support of the major program change to the Plant and Soil Science (PLS) undergraduate program. The proposed change will move control of the program that was jointly administered by the Departments of Horticulture and Plant and Soil Science, to the Department of Horticulture alone. The new program name will be Horticultural Science (HRT).

The Department of Horticulture was notified of the withdrawal of the Department Plant and Soil Science from the PLS program in January, 2018. Approval of the change to a new HRT undergraduate program was adopted by a unanimous vote (16:0) of the faculty of the Department of Horticulture at the January faculty meeting and reaffirmed by e-mail consensus in August, 2018. This included the adoption of the new program name and the changes to the major tracks detailed in the new HRT program proposal.

Our department is excited to move forward with this new program and the educational and employment opportunities it will create for our students.

Sincerely,

Mark Williams
Professor and Departmental Chair
Department of Horticulture

**University of Kentucky**
Dr. Rebecca L. McCulley
Professor & Chair
Dept. of Plant & Soil Sciences
Plant Science Bldg, Rm 106
Lexington, KY 40546-0312
P: 859-257-6388
F: 859-323-1952
www.mcculleylab.org

**Date:** September 18, 2018

**To:** Bob Geneve
Director of Undergraduate Studies, HPLS

Dear Bob,

As you requested, I am writing this letter to provide evidence that the faculty in my Department (Plant & Soil Sciences; PSS) decided to pull out of formal 'co-ownership' of the HPLS undergraduate degree program in January 2018. Please see the highlighted section of the PSS January faculty meeting notes (attached). We remain committed to teaching HPLS students in our relevant classes.

We appreciate that you shared with us the proposed changes to the HPLS degree program and associated eventual course prefix alterations before submitting for official approval. Further, we are grateful that the Horticulture faculty were willing to accommodate a few requests we made – specifically, removing 'Plant' from the degree title, agreeing to have Soil Fertility be a recommended course, and leaving the PLS minor as it is, for the time being.

We hope the HPLS degree is able to change as needed to best serve the relevant students and the Horticulture Department.

Sincerely,

Rebecca L. McCulley,
Professor & Chair
Department of Plant & Soil Sciences

# FACULTY MEETING - January 12, 2018

*Minutes taken by Elisa D'Angelo*

Good news

- Hannah P., new soil nutrient management faculty, starting in March
- Christopher Shepard, new pedology faculty, starting in July
- Two awards from Office of VP Research
    - New ICP-OES for elemental analysis, located in Ag. Sci. Chemical Analysis Lab
    - New tractor, located in Princeton
- AFRI grant awarded to Carrie Knot, emphasis on student training in agronomy
- FFAR Pollinator Health Fund grant to Erin Haramoto
- New Tekrony travel fellowships available to graduate seed science students.

Departmental Review Recommendations by External Committee

- Overall positive review, but there were 9 recommendations by the external review committee, which department needs to accept or reject….if accept, then we need to develop implementation plan and timeline…we can also add additional recommendations
- Recommendation 1 from external committee: consider a new vision/direction for the undergraduate HPLS program, due to decreasing student numbers over the last three review periods (15-20 years), despite increasing recruitment activities.
    - Options: (i) keep the program or (ii) withdraw the program, offer individualized programs similar to the Modern Agricultural Crop Production program (MACP), and renew vision of the major
    - Chair and most faculty indicated preference for option ii because, by unleashing Horticulture, we could have greater flexibility in revamping the curriculum. Also, we would not have to worry about meeting student number requirements. On the downside, Bod Pearce indicated that student marketability in job market could be adversely affected by participating in an "individualized program"
    - Jason Unrine indicated that even if a large percentage of agronomy students from regional universities came to UK, we still would not meet number requirements.
    - McNear also liked option ii, as it would allow us to reinvent the program, for example, by engaging in stakeholders in curriculum development. He also indicated that we should increase student numbers by recruiting outside KY. He also emphasized that a new PLS program should be more interdisciplinary, like the NRES program.
    - Chad Lee indicated that successful agronomy programs at regional universities have several things in common…a full-time/engaged/faculty recruiter, an active club, extensive research partnerships with companies on university farms and with students.

    - Elisa indicated that a PLS committee would greatly benefit from the insights of members of the agronomy extension group, who have more experiences with agronomy companies and farmer issues that would benefit PLS students.
- Recommendation 2: enhance scientific collaborations and transformative ideas by facilitating faculty interactions
    - Jason Unrine suggested that ad hoc working groups be established and meet on a regular basis to develop bigger proposals.
    - Rebecca (chair) suggested that a faculty retreat could be beneficial (similar to one held when Mike Barrett was chair).
    - Another idea was to hold farm tours for new faculty, or any other interested faculty. Chad indicated that he was in favor that this.
- Recommendation 3: Develop a management plan for the North Farm that would allow better access to research plots, equipment, and help from personnel.
    - Rebecca suggested that we create a committee to explore different management options.
    - Bob Pearce indicated the committee really needs to be effective, and that is a lot of room for improvement.
- Recommendation 4: Increase staff opportunities for professional development
    - It was suggested that faculty be encouraged to support staff attendance at scientific conferences.
    - It was suggested that a departmental staff travel award might be set up, similar to the $1000 award offered at the College level…a web link with a description of the opportunity was provided.
- Recommendation 5: Offer online courses for extension agents to earn graduate degrees
    - It was suggested that interested faculty contact Larry Grabau and Josh McGrath, who are working this.
- Recommendation 6 was a duplicate of another recommendation
- Recommendation 7: Improve procedural transparency and committee structure
    - Rebecca indicated that she will work on this
- Recommendation 8: Evaluate space/equipment needs for programs and develop long-term strategy for improvements.
    - Will continue to do this.
    - Jason Unrine suggested that we routinely prioritize needs and submit proposals to VPR program in collaboration with other colleges and departments to increase likelihood of success.
    - David Hildebrand suggested that faculty work more closely with USDA scientist/labs located in Ag. Sci. Building.
- Recommendation 9: Work with Office of Philanthropy and Alumni to develop specific goals
    - Will do.
- Recommendation 10: consult with current and past graduate students on ways to improve graduate experiences.

- Some ideas from graduate students made during external review: change name of IPSS (which is too general, not a good reflection of degree, and not very marketable), make sure the diploma specifies the specific option areas (e.g. soils, etc), update the graduate student handbook (some courses in current book have not been offered in a long while), improve planning and scheduling of courses, offer more courses during Spring semesters.
- Conduct a review of the IPSS program
- Dave McNear reiterated that a review should be conducted, emphasis areas on diplomas would be beneficial, and if that was not possible, to prepare our own certificates on high quality paper.
- Chris Matocha suggested that more hands on and field oriented courses would be beneficial.
- Jason Unrine suggested that faculty should engage graduate students in curriculum development
- Josh McGrath suggested that graduate students should be members of the advisory committee.
- Erin Haramoto suggested that faculty should be members of grad student meetings.

- Departmental Office changes
  - Maggie accepted Human resource position, previously held by Sawyer.
  - Vicki Pendleton is the new Travel person, previously held by Maggie
  - Budget Officer position has been upgraded and will be advertised until Jan. 22
  - Departmental Manager (Associate Chair staff position) will be advertised until Jan 15.
  - A detailed departmental staff organization chart was shown. Two main groups overseen by (i) Budget officer (Grants, Procard, Travel, and HR) and (ii) Dept. Manager (Special Event Planning, Mail/Printer)
- Policy changes
  - Can now use grant funds to pay for faculty and student memberships to professional organizations.
  - New web-based digital measures performance review program…performance reviews for all faculty due in Oct.
  - Suggest that faculty get acquainted with the digital measures system early…two training sessions offered by Megan on March 27 (am), and April 11 (afternoon).
  - Suggest making stronger Narrative Statements in the Digital Measures entry.
  - Change in procard paper work…separate line item vouchers for hotel, airline, and other travel expenses must be signed.
  - It was also suggested that faculty make appointments with office staff about arrival of new students and staff, rather than dropping by.
  - Equity in assigning departmental assistantships…the priority system works as follows:
    1. Provide assistantships to assistant professors
    2. Provide assistantships to programs with matching funds, esp. Lyman Johnson Minority Fellowships

3. Provide assistantships to faculty that have not had a departmental assistantship in many years.

Rebecca indicated that the system was pretty unpredictable and hard to implement. Dave McNear stated that he trusted the chair and it was good to have a malleable system. Todd indicated students with departmental funded assistantships must serve as Teaching Assistantships for two semesters (without compensation), and students with grant-funded assistantships were not required to serve as TAs, but if they did, were compensated with $1000 each semester.

**From:** noreply@qualtrics-survey.com
**To:** Grabau, Larry
**Subject:** Substantive Change Decision
**Date:** Tuesday, February 19, 2019 9:22:45 AM

---

Dear Larry J. Grabau,
Thank you for your email regarding the proposed program change(s) to **Horticulture, Plant and Soil Science, Bachelor's (01.1102)**.
My email will serve 2 purposes: 1.) Next steps for SACSCOC, and 2.) Verification and notification that you have contacted OSPIE—a Senate requirement for proposal approval.

1. **Next steps for SACSCOC:** None required
2. **Verification that OSPIE has reviewed the proposal:** Based on the proposal documentation presented and Substantive Change Checklist, the proposed program changes (refer to list below) are not substantive changes as defined by the University or SACSCOC, the university's regional accreditor. Therefore, no additional information is required by the Office of Strategic Planning & Institutional Effectiveness at this time. The proposed program change(s) may move forward in accordance with college and university-level approval processes.

Description of Proposed Change(s):

· i) The name of the degree is being changed from a BS in Horticulture, Plant and Soil Science to a BS in Horticultural Science. ii) The name of the major is being changed from Plant and Soil Science to Horticultural Science. iii) Previously, there were four options. The Horticultural Enterprise Management option is being renamed to the Horticultural Plant Production and Management (HPPM) option. The Crop, Soil & Horticulture Science option is being renamed to the Horticulture & Plant Science option. Both the Crops & Livestock and Turfgrass Science options are being dropped due to severely limited student enrollments. iv) The HPPM option only will accept three different CHE series: CHE 105/107/111/113 or CHE 104/108 or CHE 105/108. v) Calculus options for all students will expand from MA 123 only to MA 123 or 113 or 137. vi) The major core will remain the same except PLS 100 and PLS 440 will be added and PLS 470G will be removed. vii) The guided elective roster for the HPPM option will now include ENT 320, PPA 400G and 15 credits in ACC, AEC, ECO, ENT, or SAG. The previous guided elective roster was simply a choice of 21 credits with consent of advisor. viii) The guided elective roster for the HPS option will now include CHE 226, 230 or 236; STA 296; and 15 credits from BIO, CHE, ENT, FOR, and PPA. The previous guided elective roster included the above CHE options and STA course; in addition, a range of specifically listed or advisor approved science courses from BIO, CHE, EES, PHY, or other prefixes were also accepted.

Should you have questions or concerns about UK's substantive change policy and its procedures, please do not hesitate contacting our office.

Office of Strategic Planning & Institutional Effectiveness
University of Kentucky
Visit the Institutional Effectiveness Website: http://www.uky.edu/ie

# Appendix I

## HPLS Student Learning Assessment Plan

## B.S. Horticulture, Plant and Soil Science Program Assessment Plan

### 1. Introduction

*1.1. Unit Mission, Vision and Goals:*

The Horticulture, Plant and Soil Science (HPLS) undergraduate degree program is an interdepartmental degree program under the direction of the Department of Horticulture and Department of Plant and Soil Science in the College of Agriculture. The **mission** of the HPLS program is to educate students so that they have the scientific knowledge and technical skills needed for a career in the production and management of plants and soils for food, fiber, forage, oil, recreation, landscaping and the enhancement of the human environment. The **vision** of the program is to produce students with exception communication, computational, leadership, and interpersonal skills to become successful professionals and leaders in public and private careers related to horticulture, plant and soil science.

The HPLS program has 2 primary goals:

1. To prepare students to be successful in crop production systems designed to improve the quality of life in Kentucky, the United States, and the world.

2. To increase the number of students graduating with an HPLS degree to meet the current and anticipated needs for plant and soil science professionals in Kentucky and the United States.

*1.2 Basic Assessment Approach:*

Assessment of the HPLS program will be conducted on a two year cycle starting 2016-2017 alternating with the first three learning outcomes the first year and the last three learning outcomes the second year.

*1.3 Definition of Key Terms:*

**HPLS** – Horticulture Plant and Soil Sciences

### 2. Assessment Oversight

2.1 *College Learning Outcomes Assessment Coordinator:*

Larry Grabau, Associate Dean for Instruction, N-6 Ag Science North, (859) 257-3468, lgrabau@uky.edu

2.2 *Unit Assessment Coordinator:*

Assessment will be coordinated by John Grove and Robert Geneve from the Department of Plant and Soil Science, and Department of Horticulture, respectively.

### 3. Student Learning Outcomes

1. Students will acquire and demonstrate proficiency in scientific and technical principles of the plant, soil, and environmental sciences and illustrate their interrelatedness.

2. Students will communicate clearly in oral and written formats.
3. Students will demonstrate the critical thinking skills required to define a problem, retrieve and evaluate information, and propose and evaluate potential solutions.
4. Students will be able to explain and discuss agricultural production from a global perspective.
5. Students will obtain the foundational skills for lifelong learning.

**4. Curriculum Map** – see appendix item 1.

**5. Assessment Methods and Measures**

a) Formative assessment – Student achievement of program learning outcomes will be assessed by evaluating artifacts collected from selected courses throughout the curriculum (*see Artifact Map, appendix item 1*).
b) Summative Assessment (collected annually) – A survey will be conducted of all Senior level students aimed at identifying strengths and weaknesses of the program (*see appendix item 3*).

**6. Data Collection and Review**

6.1 *Data Collection Process/Procedures*

Samples of student's work will be collected when completed for each PLS course identified for each Student Learning Outcome (see appendix item 1). Following the completion of semester, three faculty evaluators will independently assess the student's work based on the rubrics in appendix item 2.

**7. Assessment Cycle and Data Analysis**

Student Learning Outcomes 1-3 and 4-5 will be evaluated on a 2-year cycle and a summary report (June 1) that includes the current and previous three year's assessments will be shared with the faculty. Areas of concern or curriculum improvement will be identified and strategies developed within individual courses or the HPLS program to improve student learning in the identified areas. A final report for each assessment cycle will be completed by October 31.

**8. Teaching Effectiveness**

8.1 *Identify measures of teaching effectiveness*

All instructors will use the University Teacher Course Evaluation (TCE) process to be evaluated by their students each semester. Peer review of teaching will also be made available to instructors. The Department Chair will review the TCE results and any available peer review forms to provide feedback to the instructor. This will occur on an annual basis. Instructors will also submit a teaching portfolio to the Associate Dean for Instruction on a 2-year cycle. The information will be collated by the HPLS Directors of Undergraduate Studies (Drs. Geneve and Grove) and evaluated to provide ongoing assessment of the quality of the major courses in the curriculum.

8.2. *What efforts to improve teaching effectiveness will be pursued based on these measures?*

The College and the University provide in-service learning opportunities that are being used by instructors in the HPLS program. Faculty-to-faculty teaching mentoring will also be made available to faculty requesting teaching assistance.

**9. Plans for Evaluation of Post-graduate Student Success**

The HPLS program will work with the Office of Institutional Research and the College of Agriculture career officer to generate an Alumni Survey to evaluate post-graduate employment and/or graduate education.

**10. Appendices**

**Appendix item 1 - Curriculum map for HPLS program**

Key: E = Emphasized; I = Introduced; R = Reinforced; * indicates courses where samples of student's work will be evaluated

| Course | L.O. 1. | L.O 2. | L.O. 3. | L.O. 4. | L.O. 5. |
|---|---|---|---|---|---|
| **Major core courses** | | | | | |
| PLS 104 – Plants, Soils, & People: Science Perspective | I | I* | I | I* | E |
| PLS 210 – Life processes of plants | E* | | | | I |
| PLS 220 – Introduction to plant identification | I* | I | I | | I |
| PLS 366 – Fundamentals of soil science | E | I | E* | R | R |
| PLS 386 – Plant production systems | I* | R | I | E* | R |
| PLS 399 – Experiential learning | E | E* | E | | E* |
| PLS 404 – Integrated weed management | E | E* | E | R* | R |
| PLS 470G – Soil nutrient management | E | | E | R | R |
| PLS 490 - Capstone | R | E* | E* | R | E* |
| **Major option courses** | | | | | |
| PLS 100 – Introduction to horticulture | I | I | I | I | I |
| PLS 240 – Introduction to floral design | I | R | I | I | E |
| PLS 320 – Woody horticultural plants | E* | | | | E |
| PLS 330 & 332– Herbaceous horticultural plants | E | | | | E |

| | | | | | |
|---|---|---|---|---|---|
| PLS 335 – Distillation, wine and brewery science | E | R | I | E | R |
| PLS 336 – Introduction to Viticulture: Grape production | E | R | R | E | R |
| PLS 337 – Introduction to enology: Wine production | R | I | I | E | R |
| PLS 340 - Floral design for life Events | I | I | R | I | E |
| PLS 395 – Special problems | E | E | E | | E |
| PLS 396 – Soil judging | | | | | |
| PLS 406 – Advanced soil judging | | | | | |
| PLS 408 – Tobacco | | | | | |
| PLS 412 – Grain crops | | | | | |
| PLS 440 – Plant propagation | E* | E | E | E | E |
| PLS 450G – Biogeochemistry | | | | | |
| PLS 451 – Landscape management and arboriculture | E | I | | | E |
| PLS 468G – Soil use and management | | | | | |
| PLS 502 – Ecology of economic plants | | | | | |
| PLS 510 – Forage management and utilization | E | R | R | I | E |
| PLS 514 – Grass taxonomy and identification | | | | | |
| PLS 515 – Turf management | | | | | |
| PLS 520 – Fruit and vegetable production | E* | E | E | E | E |
| PLS 525 – Floriculture and nursery crop production | E | E | E | I | E |
| PLS 531 – Field school in crop pest management | | | | | |

**Appendix item 2 – Student Learning Outcome rubrics**

**Evaluation scheme**

| **SLO 1 -** *Students will acquire and demonstrate proficiency in scientific and technical principles of the plant, soil, and environmental sciences and illustrate their interrelatedness.* | **SLO 2 -** *Students will communicate clearly in oral and written formats.* | **SLO 3 -** Students will demonstrate the critical thinking skills required to define a problem, retrieve and evaluate information, and propose and evaluate potential solutions. | **SLO 4 -** *Students will be able to explain and discuss agricultural production from a global perspective.* | **SLO 5 -** *Students will obtain the foundational skills for lifelong learning.* |
|---|---|---|---|---|
| Evaluate final exams from the following paired subject matter courses using rubric #1:<br>Plant Science PLS 210, 440;<br>Plant Identification PLS 220, 320;<br>Crop Production PLS 386 520 | Evaluate random samples of predetermined written assignments from PLS 366, PLS 490 using rubric #2a.<br>In-class evaluation of oral presentations from PLS 104, 399, 404, 490 using Rubric #2b. | Evaluate random samples of predetermined lab assignment papers from PLS 366, 440 using rubric #3. | Evaluate random samples of predetermined artifacts from PLS 104, 386, 404 using rubric #4. | Evaluate random samples of predetermined artifacts from PLS 399, PLS 490 using rubric #5. |

**SLO 1 Rubric -** *Students will acquire and demonstrate proficiency in scientific and technical principles.*

| Learning objective | Exceeds expectations (5) | Meets expectations (3) | Beginning to meet expectation (1) | Does not meet expectations (0) |
|---|---|---|---|---|
| **Subject matter competency** | Shows ability to recall facts at a high proficiency. | Shows ability to recall facts at a moderate proficiency. | Shows ability to recall facts at a low proficiency. | Unable to recall facts at a minimal proficiency. |
| **In-depth knowledge of the subject** | Shows ability to remember facts and interpret them in their own words at high proficiency. | Shows ability to remember facts and interpret them in their own words at moderate proficiency. | Shows ability to remember facts and interpret them in their own words at low proficiency. | Unable to remember facts and interpret them in their own words at a minimal proficiency. |
| **Application of knowledge** | Shows ability to apply acquired knowledge to a new situation at a high proficiency. | Shows ability to apply acquired knowledge to a new situation at a moderate proficiency. | Shows ability to apply acquired knowledge to a new situation at a low proficiency. | Unable to apply acquired knowledge to a new situation at a minimal proficiency. |

**SLO 2a Rubric -** *Students will communicate clearly in oral formats.*

| Learning objective | Exceeds expectations (5) | Meets expectations (3) | Beginning to meet expectation (1) | Does not meet expectations (0) |
|---|---|---|---|---|
| **Content organization** | Organization is clearly and consistently observable and the speaker is skillful in making the content of the presentation cohesive. There is a clear introduction, body and conclusion to the presentation. | Organization is clearly and consistently observable within the presentation, but there is a not a clear introduction, body and conclusion to the presentation. | Organization is only intermittently observable within the presentation. It lacks flow between the introduction to the conclusion in the presentation. | Organization is poor. There is no introduction, body and conclusion observable within the presentation. |
| **Delivery and language skills** | Language choices are and delivery is compelling, and enhances the effectiveness of the presentation. Speaker makes appropriate choices in presentation format. | Language choices are thoughtful and generally support the effectiveness of the presentation. Speaker makes appropriate choices in presentation format. | Language choices are mundane and only partially support the effectiveness of the presentation. Speaker does not make appropriate choices in presentation format. | Language choices are unclear and minimally support the effectiveness of the presentation. Language and presentation choices are not appropriate to audience. |
| **Content quality** | Supporting materials make appropriate reference to information that specifically supports the presentation and establishes the | Supporting materials make appropriate reference to information that generally supports the presentation and establishes the | Supporting materials only partially supports the presentations content. | Supporting materials are insufficient to supports the presentations content. |

| | | | | |
|---|---|---|---|---|
| | presenter's credibility on the topic. | presenter's credibility on the topic. | | |
| **Message and summation** | Central message and summary are compelling and strongly presented. | Central message and summary are clear and consistent and supported by the evidence presented. | Central message and summary are basically understandable but is not often repeated and is not memorable. | Central message can be deduced, but is not explicitly stated. Summary is missing or not consistent with evidence presented. |

**SLO 2b Rubric -** *Students will communicate clearly written formats.*

| Learning objective | Exceeds expectations (5) | Meets expectations (3) | Beginning to meet expectation (1) | Does not meet expectations (0) |
|---|---|---|---|---|
| **Content development** | Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work. | Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work. | Uses appropriate and relevant content to develop and explore ideas through most of the work. | Uses appropriate and relevant content to develop simple ideas in some parts of the work. |
| **Evidence of support and sources for content** | Demonstrates skillful use of high quality, credible, relevant sources to | Demonstrates consistent use of credible, relevant sources to support ideas that are | Demonstrates an attempt to use credible and/or relevant sources to support ideas | Demonstrates an attempt to use sources to support ideas in the writing. |

| | | | | |
|---|---|---|---|---|
| | develop ideas that are appropriate for the discipline and genre of the writing | situated within the discipline and genre of the writing. | that are appropriate for the discipline and genre of the writing. | |
| **Writing proficiency** | Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error free. | Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors. | Uses language that generally conveys meaning to readers with clarity, although writing may include some errors. | Uses language that sometimes impedes meaning because of errors in usage. |

**SLO 3 - Rubric** Students will demonstrate the critical thinking skills

| Learning objective | Exceeds expectations (5) | Meets expectations (3) | Beginning to meet expectation (1) | Does not meet expectations (0) |
|---|---|---|---|---|
| **Problem definition** | Identifies a creative, focused, and manageable topic and adequately defines appropriate aspects the problem. | Identifies a focused and manageable topic that appropriately addresses relevant aspects of the topic, but does not adequately define appropriate aspects of the problem. | Identifies a topic that while manageable is too narrowly focused and leaves out relevant aspects of the topic. | Identifies a topic that is far too general and wide-ranging as to be manageable. |
| **Background development** | Synthesizes in-depth information from relevant sources representing various points of view. | Presents but does not adequately synthesize in-depth information from relevant sources representing various points of view. | Presents information from relevant sources representing limited points of view. | Presents information from irrelevant sources representing limited points of view/ approaches. |
| **Hypothesis or objective development** | Proposes one or more objectives that indicate a deep comprehension of the problem. | Proposes one or more objectives that indicate comprehension of the problem. | Proposes one objective that is not specific for the problem. | Proposes an objective that is difficult to evaluate because it is vague or only indirectly addresses the problem. |
| **Solution implementation** | All elements of the methodology are explained and described in detail. | Critical elements of the methodology presented but not described in adequate detail. | Critical elements of the methodology are missing. | Description of methodology demonstrates a |

| | | | | |
|---|---|---|---|---|
| | | | | misunderstanding of the methodology. |
| **Outcome evaluation** | Conclusions are supported by appropriate sources and synthesizes evidence to reveal insightful patterns, differences, or similarities related to problem. | Conclusions are generally supported by appropriate sources and to reveal important patterns, differences, or similarities related to problem. | Conclusions are generally not supported by appropriate sources and there is little discussion concerning important patterns, differences, or similarities related to problem. | Lists evidence, but conclusions are not organized or supported. |

**SLO 4 - Rubric** *Students will be able to explain and discuss agricultural production from a global perspective.*

| Learning objective | Exceeds expectations (5) | Meets expectations (3) | Beginning to meet expectation (1) | Does not meet expectations (0) |
|---|---|---|---|---|
| **Global self-awareness** | Effectively addresses significant issues in the natural and human world based on articulating one's identity in a global context. | Evaluates the global impact of one's own and others' specific local actions on the natural and human world. | Analyzes ways that human actions influence the natural and human world. | Identifies some connections between an individual's personal decision-making and certain local and global issues. |
| **Personal perspectives** | Evaluates and applies diverse perspectives to complex | Synthesizes other perspectives (such as cultural, | Identifies and explains multiple perspectives (such as | Identifies multiple perspectives while maintaining a value |

| | | | | |
|---|---|---|---|---|
| | subjects within natural and human systems in the face of multiple and even conflicting positions (i.e. cultural, disciplinary, and ethical.) | disciplinary, and ethical) when investigating subjects within natural and human systems. | cultural, disciplinary, and ethical) when exploring subjects within natural and human systems. | preference for own positioning (such as cultural, disciplinary, and ethical). |
| **Understanding global production systems** | Uses deep knowledge of the historic and contemporary role and differential effects of human organizations and actions on global systems to develop and advocate for informed, appropriate action to solve complex problems in the human and natural worlds. | Analyzes major elements of global systems, including their historic and contemporary interconnections and the differential effects of human organizations and actions, to pose elementary solutions to complex problems in the human and natural worlds. | Examines the historical and contemporary roles, interconnections, and differential effects of human organizations and actions on global systems within the human and the natural worlds. | Identifies the basic role of some global and local institutions, ideas, and processes in the human and natural worlds. |

**SLO 5 Rubric -** *Students will obtain the foundational skills for lifelong learning.*

| Learning objective | Exceeds expectations (5) | Meets expectations (3) | Beginning to meet expectation (1) | Does not meet expectations (0) |
|---|---|---|---|---|
| **Initiative and Independence** | Pursues opportunities to expand knowledge, skills, and abilities outside the classroom. Knowledge and/or experiences are pursued independently | Pursues educational opportunities outside the classroom through organized extracurricular activities | Begins to look beyond coursework requirements, showing interest in pursuing knowledge independently | Shows very little interest in pursuing additional knowledge beyond coursework requirements. |
| **Transfer** | Makes references to previous learning and applies in a new way that is applied to novel situations. | Makes references to previous learning and attempts to apply acquired knowledge to novel situations. | Makes vague references to previous learning but does not attempt to apply previously acquired knowledge to novel situations. | Does not recognize connection between previously acquired knowledge and the ability to apply it to a novel situation. |
| **Reflection** | Reviews prior learning in depth to reveal significantly changed perspectives about educational and life experiences. | Reviews prior learning in depth to indicate broader perspectives about educational or life events. | Reviews prior learning with some depth developing a somewhat broader perspectives about educational or life events. | Reviews prior learning at a surface level, without developing a broader perspective about educational or life events. |

**Appendix item 3** - Senior student's evaluation of their learning experience

We value your opinion, so we are asking you to evaluate the strengths and weaknesses of our program. The information is important because it will allow us to adapt the program to better fit future student needs. It will also give us information that we may need to justify requesting additional resources for the Horticulture, Plant and Soil Science program in the future. Be assured that your responses will be kept confidential. Thanks in advance for your responses and please stay in touch with us after your graduation. We really enjoy knowing how you are doing in your career.

1. Check those areas that apply to your personal situation while at UK.

| | | |
|---|---|---|
| Demographic information | | I am in the Horticulture Enterprise Management option. |
| | | I am in the Turfgrass Science option. |
| | | I am in the Crops and Livestocks option. |
| | | I am in the HPLS Science option. |
| | | I attended a previous college before entering UK. |
| | | I am an out-of-state student. |
| | | I participated in an extra-curricular club. |
| | | I pursued a minor during my degree program. |
| | | I received a scholarship while at UK. |

2. Select the degree to which you agree or disagree with the following statements:

| | Strongly Disagree (1) | Somewhat Disagree (2) | Somewhat Agree (3) | Strongly Agree (4) |
|---|---|---|---|---|
| a) Your HPLS coursework has provided you with the basic scientific and technical skills you will need in your career. | | | | |
| b) Your HPLS coursework has made you a better communicator? | | | | |
| c) Your HPLS coursework has made you better prepared to solve problems you might encounter in the work place. | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| d) You would recommend the UK HPLS program to other students. | | | | |

3. Were there required courses (not including UK Core courses), that you felt did not contribute to your knowledge of HPLS or help prepare you for your career and you feel should be amended or dropped from the curriculum? If so, please comment on those courses.

4. Are there any new courses or subject areas that you feel could be included to improve the HPLS curriculum and help prepare students for a career in horticulture? If so, please comment on those areas.

5. Provide the top two experiences (academic or otherwise) that have contributed the most to preparing you for your career.

6. Provide any additional suggestions for improvement for the HPLS undergraduate program.

# Appendix J

## Extension Contact Statistics

**APPENDIX ?? - Statistical Contacts for Horticulture Extension Faculty, Extension Associates and Staff**

| Fiscal Year | Number Employees Reporting | Faculty | Staff | Days | Multistate | Total Contacts | White | Black | Asian | American Indian | Cannot be Determined | Other | Hispanic | Male | Female | Number of Adult Volunteers | Number of Youth Participants (18 and under) | Number of Indirect Contacts |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FY 2019 | 11 | 5 | 6 | 1950 | 237 | 182,164 | 12,077 | 269 | 156 | 7 | 169,619 | 9 | 123 | 85,256 | 96,908 | 32 | 1185 | 882,738 |
| FY 2018 | 14 | 6 | 8 | 2875 | 224 | 55,803 | 26,991 | 512 | 314 | 46 | 27,878 | 58 | 434 | 31,583 | 24,220 | 225 | 763 | 761,081 |
| FY 2017 | 12 | 5 | 7 | 2541 | 419 | 42,262 | 23,798 | 532 | 217 | 15 | 17,664 | 36 | 168 | 26,499 | 15,763 | 23 | 906 | 217,910 |
| FY 2016 | 12 | 6 | 6 | 2798 | 225 | 46,481 | 25,018 | 616 | 502 | 9 | 20,303 | 33 | 663 | 30,849 | 15,632 | 269 | 544 | 137,451 |
| FY 2015 | 13 | 6 | 7 | 3852 | 237 | 25,188 | 20,944 | 722 | 405 | 19 | 2,991 | 107 | 306 | 17,850 | 7,338 | 32 | 1479 | 478,138 |
| FY 2014 | 12 | 5 | 7 | 3297 | 202 | 23,326 | 14,300 | 313 | 352 | 32 | 8,326 | 13 | 304 | 16,099 | 7,237 | 22 | 73 | 190,690 |
| **TOTALS** | | | | **17313** | **1544** | **375,224** | **123,128** | **2964** | **1946** | **128** | **246,781** | **256** | **1998** | **208,136** | **167,098** | **603** | **4950** | **2,668,008** |

# Appendix K

## Extension Success Stories

APPENDIX K
Success Stories for Horticulture Extension Faculty, Extension Associates & Staff

Fiscal Year 2014 (9 Total Statements)

| Title | Extension Professional |
|---|---|
| Master Gardener Presentations on Home Fruit Production | Becker, Daniel W |
| Center for Crop Diversification Develops Regional Presence | Cassady, Christy G |
| Center for Crop Diversification Profiles | Cassady, Christy G |
| Crop Diversification Marketing Strategy | Cassady, Christy G |
| New Procedure for Partially Filled Wine Containers | Cottrell, Thomas H |
| Growing Tomatoes, Growing Solutions | Saha, Shubin K |
| Annual Plasticulture Strawberry Production | Wright, Shawn |
| Great Lakes Vegetable Working Group Scouting Apps | Wright, Shawn |
| Rhubarb Production | Wright, Shawn |

Fiscal Year 2015 (17 Total Statements)

| Title | Extension Professional |
|---|---|
| Steps Taken to Improve Vineyard Management | Becker, Daniel W |
| Hops 101 Webinar | Cassady, Christy G |
| All-American Selections Display Garden at The Arboretum Wins National Contest | Durham, Richard E |
| KY Master Gardeners Participate in the Korean International Master Gardener Conference | Durham, Richard E |
| Awareness of Challenges Facing Lexington Kentucky's Urban Canopy | Fountain, William M |
| LFUCG Urban Forestry Species Health Awareness | Fountain, William M |
| Planning and Implementation of an Enhanced Canopy Cover in Louisville, Kentucky | Fountain, William M |
| Providing Tree Assessment Following Weather Events | Fountain, William M |
| Increasing Impact by Use of You Tube | Grable, Carey A |
| Mid-Summer Fertility Fix | Grable, Carey A |
| Horticultural Crops for Diversification of Kentucky Farms and as Alternatives to Tobacco | Ingram, Dewayne L |
| Nursery Crop Production Extension Website | Knight, Joshua |
| Converting a Tobacco Transplant Greenhouse for Soilless Culture of Tomatoes | Saha, Shubin K |
| NRCS High Tunnel Consultations Eastern Kentucky | Saha, Shubin K |
| Kohlrabi Growing in Importance | Strang, John G |
| 4-H Beekeeping Workshop | Wright, Shawn |
| Hops Webinar | Wright, Shawn |

Fiscal Year 2016 (9 Total Statements)

| Title | Extension Professional |
|---|---|
| Center for Crop Diversification Resource Enhancement | Cassady, Christy G |
| Ginseng Webinar Answers Grower's Questions | Cassady, Christy G |
| Developing a Southeast Regional Pest Management Guide for | |

| | |
|---|---|
| Nursery Crops and Landscape Plants | Dunwell, Winston C |
| Kentucky Extension Master Gardener Program Impact | Durham, Richard E |
| Louisville Urban Forest Canopy Cover | Durham, Richard E |
| The Cost of Failure to Properly Install and Maintain Urban Trees | Fountain, William M |
| Growth of Horticultural Industries Contributes to Diversification of Kentucky Farms | Ingram, Dewayne L |
| Facebook Page | Wright, Shawn |
| High Tunnel Strawberries | Wright, Shawn |

Fiscal Year 2017 (10 Total Statements)

| Title | Extension Professional |
|---|---|
| Koru Garden Success | Becker, Daniel W |
| Love Shack Farm Success | Becker, Daniel W |
| What to Think About Before You Plant Resources | Cassady, Christy G |
| Centuries Old Ginkgo Preserved as Landmark in Clay Co. | Fountain, William M |
| Risk Assessment UK Campus | Fountain, William M |
| Increased Efficiency in Field Production of Landscape Trees | Ingram, Dewayne L |
| Management of High Alkalinity Irrigation Water in Container Nurseries | Ingram, Dewayne L |
| Abundance and Seasonal Flight of Invasive Ambrosia Beetles in Western Kentucky | Viloria, Zenaida J |
| Controlled Release Fertilizer Application in Container Nursery Crops | Viloria, Zenaida J |
| Growing Beekeeping | Wright, Shawn |

Fiscal Year 2018 (25 Total Statements)

| Title | Extension Professional |
|---|---|
| Saving a Vineyard | Smigell, Chris |
| New Blueberry Grower Success | Smigell, Chris |
| Help for a Small Winery in Southern Kentucky | Smigell, Chris |
| Larue County Farmer Expands Production | Smigell, Chris |
| Emergency Help for a Blueberry Grower | Smigell, Chris |
| More Emergency Help for Blueberry Growers | Smigell, Chris |
| Diversification into Horticultural Crops Resulting from Intensive On-Farm Demonstration and Consultation | Ingram, Dewayne L |
| Analysis of Landscape Plant Production System Components Using Life Cycle Assessment Identified Ways to Reduce Greenhouse Gas Emissions and Variable Costs | Ingram, Dewayne L |
| Tree Risk Assessment Program & Tree and Landscape Appraisal Training | Fountain, William M |
| Arboricultural Assessment and Report Writing | Fountain, William M |
| Cucumber Grower | Rudolph, Rachel |
| Plasticulture Strawberry Production | Wright, Shawn |
| Hops for Kentucky | Wright, Shawn |

| | |
|---|---|
| Nursery Crops Extension Research Website | Knight, Joshua |
| NYNURSERIES-L Listserv | Knight, Joshua |
| 2017 Vegetable and Melon Budgets | Cassady, Christy G |
| Engaging Elementary Students into Horticulture with Cooperation of Master Gardeners and Through Multidisciplinary Approaches in Rural KY | Dunwell, Winston C |
| Lake Barkley Vineyards | Becker, Daniel W |
| Black Oak Vineyards | Becker, Daniel W |
| Koru Gardens | Becker, Daniel W |
| Kentucky Extension Master Gardener Program Social Media | Durham, Richard E |
| Kentucky Master Gardener State Conferences to Involve Award Recognitions | Durham, Richard E |
| Lewis County Courthouse Tree Assessment | Fountain, William M |
| National Weather Service Revisions to the EF Scale | Fountain, William M |
| Bluegrass-Buckeye Yard and Garden Live | Fountain, William M |

Fiscal Year 2019 (12 Total Statements)

| Title | Extension Professional |
|---|---|
| Underwood Farm Asparagus | Becker, Daniel W |
| Huyck Farms | Becker, Daniel W |
| Ellison Farms Strawberries | Becker, Daniel W |
| Shadowden Farms Strawberries | Becker, Daniel W |
| Tree Risk Assessment | Fountain, William M |
| Tree Walk for Mobility Challenged | Fountain, William M |
| Tree and Plant Appraisal for Green Industry Professionals | Fountain, William M |
| Bluegrass-Buckeye Yard and Garden Live | Fountain, William M |
| Season Extension | Wright, Shawn |
| Pawpaws | Wright, Shawn |
| Kentucky Vegetable and Melon Budgets Update | Cassady, Christy G |
| Equipping Agents for Master Gardener Training | Durham, Richard |

College of Agriculture, Food and Environment
Department of Horticulture
Periodic Program Review
Site Visit Agenda (updated 6/1/2020)
June 8 - 12, 2020

| | |
|---|---|
| Date: | June 8, 2020 |
| Day 1: | Monday |

| | |
|---|---|
| 12:30 – 1:00 pm EST | Committee test Zoom meeting https://uky.zoom.us/j/97575329927 |
| 1:00 – 2:00 pm EST | Meeting with College of Agriculture, Food and Environment Dean Cox and Associate Dean for Faculty Resources, Planning and Assessment Dr. Brian Lee. Committee receives their charge from Dean Cox and Dr. Lee reviews rules and procedures. https://uky.zoom.us/j/97575329927 |
| 2:00 – 2:30 pm EST | Break |
| 2:30 – 4:30 pm EST | Meet Dr. Mark Williams, department chair, and other department members for discussion and virtual farms and facilities tour. https://uky.zoom.us/j/97575329927 |
| 4:30 – 5:00 pm EST | Committee discussion of next steps (continuation of same zoom meeting after discussion with Dr. Williams ends). https://uky.zoom.us/j/97575329927 |

| | |
|---|---|
| Date: | June 9, 2020 |
| Day 2: | Tuesday |

| | |
|---|---|
| 12:00 – 12:30 pm EST | Meeting with departmental farm staff, departmental faculty committee member recused. https://uky.zoom.us/j/96098507733 |
| 12:30 – 1:00 pm EST | Meeting with Arboretum staff, departmental faculty committee member recused. Continuation of prior Zoom meeting with a change of departmental staff attendees. https://uky.zoom.us/j/96098507733 |
| 1:00 – 2:00 pm EST | Meeting with departmental office and laboratory staff, departmental faculty committee member recused. https://uky.zoom.us/j/96098507733 |
| 2:00 – 3:00 pm EST | Break |
| 3:00 – 4:00 pm EST | Meeting with departmental faculty. https://uky.zoom.us/j/99800699600 |
| 4:00 – 5:00 pm EST | Meeting with stakeholders and industry partners. https://uky.zoom.us/j/98998612081 |

| Date: June 10, 2020<br>Day 3: Wednesday | |
|---|---|
| 12:00 – 1:00 pm EST | Meeting with departmental undergraduate students in the HPLS program. Departmental faculty committee member recused.<br>https://uky.zoom.us/j/99474564496 |
| 1:00 – 2:00 pm EST | Meeting with departmental undergraduate students in the DWBS program. Departmental faculty committee member recused.<br>https://uky.zoom.us/j/92396500502 |
| 2:00 – 3:00 pm EST | Break |
| 3:00 – 4:00 pm EST | Meeting with departmental graduate students and post-doctoral scholars, departmental faculty committee member recused.<br>https://uky.zoom.us/j/92501584617 |
| 4:00 – 5:00 pm EST | Meeting with departmental alumni from all programs<br>https://uky.zoom.us/j/93507240136 |

| Date: June 11, 2020<br>Day 4: Thursday | |
|---|---|
| 1:00 – 2:00 pm EST | Meeting with Extension agents, departmental faculty committee member recused.<br>https://uky.zoom.us/j/93893074049 |
| 2:00 – 3:00 pm EST | Meeting with Associate Deans. https://uky.zoom.us/j/97300258880<br>Dr. Bob Houtz, Research<br>Dr. Carmen Agouridis, Instruction<br>Dr. Laura Stephenson, Extension<br>Dr. Orlando Chambers, Administration (facilities)<br>Dr. Brian Lee, Faculty Resources, Planning and Assessment<br>Note- additional college administrators may be invited to attend if available at the committee's discretion. |
| 3:00 - 3:30 pm EST | Break |
| 3:30 – 6:30 pm EST | Committee working session and discussion of next steps. This meeting is at the committee's discretion and may be shortened, lengthened, or cancelled as needed. Zoom link from prior meeting will be used. https://uky.zoom.us/j/97300258880 |

| Date: June 12, 2020<br>Day 4: Friday | |
|---|---|
| 11:00 am – 2:00 pm EST | Committee working session, breakout groups, and breaks at committee discretion.<br>https://uky.zoom.us/j/96454678672 |
| 2:00 – 3:00 pm EST | Committee presents preliminary findings to Dean Cox and college leadership.<br>https://uky.zoom.us/j/96454678672 |

Review Committee

| | |
|---|---|
| Dr. Jeff Stringer | Committee Chair and Chair of UK Forestry and Natural Resources |
| Dr. Desmond Layne | Horticulture Dept. Head, Auburn University |
| Dr. Harry Klee | Professor, Horticultural Sciences, University of Florida |
| Dr. Greg Davis | Director, UK Forensic Pathology Consultation Service |
| Dr. Cindy Finneseth | Executive Director, KY Horticulture Council |
| Alexis Sheffield | Kentucky Cooperative Extension Service, Boyle County Office |
| Dr. Krista Jacobsen | Associate Professor, UK Department of Horticulture |
| Steve Diver | Farm Superintendent, UK Horticulture Research Farm |
| Layne Ellen Harris | Graduate Student, UK Departments of Horticulture / Plant &Soil Sciences |

Support for Review

| Committee | Office Phone # | Cell # |
|---|---|---|
| Dr. Brian Lee | 859-257-7249 | |
| Tricia Coakley | 859-257-7041 | 859-489-9913 |

University of Kentucky
College of Agriculture, Food and Environment

# Department of Horticulture

## 2020 Periodic Program Review

Review Committee site visit June 8 - 12, 2020

Conducted via Video Zoom Meetings

**Review Report Submitted on July 7, 2020 by:**

| | |
|---|---|
| Dr. Jeffrey Stringer | Committee Chair and Chair of UK Forestry and Natural Resources |
| Dr. Desmond Layne | Horticulture Dept. Head, Auburn University |
| Dr. Harry Klee | Professor, Horticultural Sciences, University of Florida |
| Dr. Greg Davis | Director, UK Forensic Pathology Consultation Service and Professor of Pathology and Laboratory Medicine |
| Dr. Cindy Finneseth | Executive Director, KY Horticulture Council |
| Alexis Sheffield | Kentucky Cooperative Extension Service, Boyle County Office |
| Dr. Krista Jacobsen | Associate Professor, UK Department of Horticulture |
| Steve Diver | Farm Superintendent, UK Horticulture Research Farm |
| Layne Ellen Harris | Graduate Student, UK Departments of Horticulture / Plant & Soil Sciences |

**Executive Summary**

The Department of Horticulture can play a positive role—and may be in the best position of all departments—to increase public engagement for CAFE. It is unique in its ability to bridge rural and urban divides, add to positive health outcomes and community economic development, and contribute to solutions that engage a wide range of stakeholders across the commonwealth.

The Department has positioned itself well to leverage resources that it has been afforded over the last two decades to advance its mission well into the future. However, to do so, it must hold its current faculty lines and develop a sound strategy for filling upcoming retirements to balance research, extension, and instruction.

All of the holistic and mission-specific strengths, challenges, opportunities, and the resulting recommendations were directly based on input from the listening sessions and review of the departmental Self-study Report. There was a high degree of thematic consistency among those involved in the listening sessions and a high degree of interest from all stakeholders in engaging with and improving the department. It is in this vein of enthusiasm for the department and its potential that the Review Committee was able to draft this report and provide recommendations. While there are a number of challenges that face the department, there exists many easily accessible opportunities that can be used to address the challenges. Further, we believe that there is significant motivation and a high degree of competency within department leadership and among its stakeholders to capitalize on both short- and long-term opportunities for the betterment of the department, college, and university.

**Brief description of external review committee process**

- Prior to the review, all committee members received and studied the departmental Self-study Report submitted by Dr. Mark Williams (Horticulture Department Chair).
- The committee received their charge from Dean Cox, and Dr. Lee, Associate Dean for Faculty Resources, Planning and Assessment, conducted listening sessions via Zoom video conference with departmental faculty, staff, students, as well as partners and stakeholders including broad input from industry. June 8 – 11.
- On Friday, June 12, the committee held virtual working sessions and drafted language about the program's strengths, challenges, and potential committee recommendations.
- Immediately following the working sessions, the committee presented draft recommendations to Dean Cox and CAFE leadership.
- The Committee Chair, Dr. Jeff Stringer, worked with the committee to prepare this report which all members of the committee have approved.

Please note: The review committee has indicated where our recommendations address goals of the College Agriculture, Food and Environment Strategic Plan 2015 – 2020 in the text following the recommendation (e.g., Goal #).

Goal 1: Prepare highly motivated and culturally adaptive graduates who are competitive in a global economy and support societal values.

Goal 2: Build and nurture relationships with the people of the Commonwealth and across the world.

Goal 3: Recruit, develop, and retain exceptional faculty and staff who are leaders in expanding knowledge to improve the quality of life and sustainability of the human and physical environment.

Goal 4: Show CAFE commitment to diversity and inclusion to attract and retain students, staff, and faculty, and provide a culturally aware environment for successful engagement in a global society.

Goal 5: Produce innovative solutions through multidisciplinary collaborations.

Goal 6: Build state-of-the-art facilities equipped with cutting-edge technology.

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We begin the following report with our recommendations for the department to act on over the coming six-year program review cycle. We then provide a brief list of departmental strengths, challenges, and opportunities the committee observed through review of the departmental self-study and listening sessions with each group, which were considered for development of our recommendations.

**Committee Recommendations**

1. **Develop a sustainable funding model for the Horticulture Research Farm (HRF).** (CAFE Strategic Plan Goals 3 and 5)

    - Develop a business plan specifically outlining costs by focus area and alternatives for sustaining income streams.
    - Consider philanthropic funding options aligned with departmental development efforts (see recommendation 6).
    - Industry sponsored projects that contribute to operating costs and student support are desirable and should be considered. Explore implementation of a user fee policy (such as plot fees) to contribute to farm operating costs.

2. **Implement a formal reporting method for farm safety considerations, which ensures utility for all farm participants and timely administrative response.**

3. **Implement regular internal departmental communications to facilitate collaboration and understanding of departmental needs, priorities, and outcomes.** (CAFE Strategic Plan Goal 3)

Suggestions for achieving this recommendation include:

- Revitalize/create a vibrant, regular departmental seminar series to include current faculty research updates, graduate student presentations (proposal, final seminar), extension program updates/impacts, invited speakers from industry (e.g., successful alumni), and invited scientist guests (collaborators, national leaders, etc.).
- Weekly or monthly "digest" email with submissions from faculty, staff, and students as a communication method for current events and sharing successes.

4. **Implement effective plan for regular, transparent communication with external audiences including industry stakeholders, Extension agents, and engaged public**. (CAFE Strategic Plan Goal 2)

Suggestions for achieving this recommendations include:

- Create formal, regularly scheduled (e.g., semi-annual) meetings with key stakeholder groups, including industry, Extension agents, alumni, and engaged public. This could be accomplished by attending meetings normally being held by stakeholder groups.
- Invite external audiences to departmental seminar series (see recommendation 3).
- Develop a method for regular communications with external audiences.

5. **Develop a strategic plan, including a succession plan to address faculty retirements and potential loss of expertise and stakeholder relationships in a manner that maintains balance among outreach, research and instruction and supports diversity and inclusion initiatives.** (CAFE Strategic Plan Goals 3, 4, and 5)

The following suggestions are potentially useful in strategic plan development and implementation.

- Use national research funding trend data to assess priority areas for recruiting.
- Use departmental aggregate DOE portfolio to balance mission area effort with overall department goals for use in recruiting new faculty.
- Conduct needs and opportunity assessment of research, Extension, and instructional programs.
- Consider faculty and Extension staff cluster hiring and opportunities for interdepartmental and inter-college collaborations.
- Explore multi-state Extension hiring opportunities.

6. **Work with the college Office of Philanthropy and Alumni to construct a development plan to engage alumni, stakeholders and partners, aimed at developing scholarships,**

**endowments, named professorships, etc. for the department's programs and facilities.** (CAFE Strategic Plan Goal 1 and 6)

7. **Develop strategies and resources to provide effective recruiting for the HRT program and develop critical student services including retention, internships, and job placement. (**CAFE Strategic Plan Goals 1 and 4)

Among options to consider would be the hiring an Academic Coordinator or other appropriate position to facilitate the following:

- Leverage industry partnerships to recruit, train and place students in internships and graduates in careers.
- Continue to support the activities of the Horticulture Club and leverage activities for academic program recruitment and retention.
- Investigate options for development of formal pipelines from community college programs.
- Collaborate with college Director of Diversity and Inclusion to identify and implement diversity initiatives in recruiting.

8. **Explore diversified funding opportunities in collaboration with the Kentucky Horticulture Council (KHC).** (CAFE Strategic Plan Goals 3 and 5)

- The Department Chair and KHC Executive Director, who represents industry stakeholders statewide, should meet to discuss industry priorities and expectations, as well as departmental opportunities, student outcomes, program implementation and accountability. This meeting should take place in advance of the KHC report submission or other agreed upon interval.

9. **Restructure department website for improved user experience and develop social media platform to support all mission areas. (**CAFE Strategic Plan Goal 2)

This should focus on, but not be limited to:

- Improve website accessibility of departmental publications.
- Highlight work done by departmental students, research and Extension.

**Overall Strengths**

- The Horticulture Research Farm (HRF) serves as not only a valuable research site for the department, but also as an important public relations resource for the department, college, and university.
- Engaged and committed faculty and staff, interested in department visioning and development.
- Interested stakeholders and alumni who are willing to engage and assist in department growth.
- Strong research enterprise covering a broad range of focus areas.
- Horticulture Club is a highly respected and visible institution that is, and can remain, a strong recruiting and publicity tool.

**Overall Challenges**

- Impending retirements can impact relationships and service capacity to industry, Extension, and other stakeholders.
- Serving a broad range of stakeholders and industry while maintaining balance between Extension services and applied research.
- Re-envisioned undergraduate program will require development of resources to address recruitment, student services, and program needs.
- There is a high dependency on shrinking legacy funding sources for critical department assets.
- The pool for recruiting diverse students and faculty is limited and methods for addressing this are complex.

**Overall Opportunities**

- Faculty succession, due to impending retirements, provides opportunities for evaluation and reassessment of focus areas and an opportunity to increase faculty diversity.
- The current global focus on rural and urban human health presents opportunities for engagement of the department across all of its mission areas.
- Leveraging stakeholders and alumni can help with funding and strategic planning, which will strengthen relationships with the broader community.
- With the recent transfer of the HRT program to the department, opportunities exists for re-envisioning and strategic planning aimed at maximizing program success and impact.
- Programs and support offered by the CAFE Office of Diversity presents opportunities for faculty, staff, and student diversification.

## Facilities

### Strengths

- The Horticulture Research Farm (HRF) serves as not only a valuable research site for the department, but also as an important public relations resource for stakeholder and public engagement for the department, college, and university.

- The arboretum, and its committed and hardworking staff, provides a valuable service to the community and an opportunity for department recognition with the general public. There is a consensus that the arboretum has a committed and hardworking staff.

### Challenges

- Facilities (e.g., lab space) are a problem for high quality faculty recruitment.
- Spatial dispersion of personnel in different buildings/farm locations/off-campus sites creates real and perceived "distance" that needs to be more effectively bridged through regular communication of department programs, changes in faculty and staff, and other issues affecting the department.
- Arboretum staff feel underappreciated by the general public.
- Arboretum staff are unsure of their role in the department and how the various areas at the Arboretum are to be used.
- There is general concern over Arboretum funding and resource allocation.
- The Arboretum has two primary funding sources, UK PPD and CAFE that can, at times, lead to confusion on goal and work expectations and prioritization.
- There is concern over the lack of respect for cleanliness associated with Greenhouse #12 that can potentially impact the effective use of the facility.
- There has been a perceived lack of historical communication and a disconnect, between farm staff and department administration, that can lead to an uncertainty of the chain of command. However, farm staff did feel comfortable that the current chair is concerned and is responsive to issues.

There was a general concern regarding farm operational safety and the ability to report and address issues. An effective procedural system is needed to allow for safety issue reporting that provides anonymity and helps to ensure responsiveness. More training should be made available to focus on safety for new employees, or students working on the farm. The HRF undergoes safety audits and programs for specific operations and work areas, for example pesticide storage, handling and application accounting, however there is not a holistic safety audit conducted at HFC. The HRF should either establish, or participate in, an annual safety audit of operations and be accountable to address changes/recommendations in a timely manner.

### Opportunities

- Farm staff is interested in, and believes it would be helpful to have, regular communication via email of holistic issues that impact farm staff and/or operations (fuel tank servicing, gate not working, repairs, etc.)
- Arboretum improvements needed include:

    - Interpretation and signage is old and needs to be replaced and upgraded,
    - Collections need to be updated,
    - Better integration and opportunities with horticulture dept. courses and programs.
    - Potential issue of lack of an on-site arborist, however PPD is used monthly.
    - Need for increased web/social media presence for fundraising and public engagement.
- Improve respect for shared spaces and cleanliness of Greenhouse #12.

## Instruction

### Strengths

- Horticulture courses are usually enrolled to capacity by a mix of Horticulture and other majors indicating strong interest in course topics.
- CAFE administration acknowledged the importance of the Horticulture Club as providing a strong public face to the college/department and that this is something that is valued and grown as a means to recruit students to CAFE in general, and to HORT, specifically.
- Alumni interviewed by the committee were very interested in developing a strong connection to the department and were interested in staying informed about the department and in assisting the department and its students.

### Challenges

- Development of the Horticulture Science program may require steps to ensure Horticulture majors are given priority over non-horticulture majors to be able to enroll in Horticulture courses before they are filled by other majors.
- Maintenance of sufficient instructional DOE and lack of adequate experiential learning spaces, are recognized by the faculty as impediments to undergraduate degree program growth.

### Opportunities

- Arboretum staff are interested in, and see value in, their engagement with HRT classes.
- Stakeholders indicate willingness to serve on a formal industry advisory board.
- A regular Department Seminar Series with stakeholders could provide opportunity for increased student engagement and Horticulture program enrollment.
- Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS) could be used to help recruit and retain a more diverse student body to the HRT program.
- Alumni recommended that the department focus on exposing students to job opportunities in horticulture and actively assisting in internships and extracurricular experiences to develop job ready graduates.
  Recommendations to help with student engagement include:
    - Develop a strategy and a program to communicate and engage alumni in holistic advisement for the department and develop a partnership to assist in student development.

    - Consider developing a moderated social media platform for alumni connection/communication (e.g., Facebook Group, LinkedIn Group, etc.)
    - Develop/promote on-campus engagement using the HRF and Arboretum as well as university and CAFE events, ex: tailgating at sporting events.
- It is strongly recommended to consider developing a staff position (Academic Coordinator or similar position) to directly facilitate and/or develop programs for undergraduate recruitment, retention (including extracurricular and club engagement), and placement, and assist the Department with alumni engagement.
- Develop a sustainable and effective student academic advising strategy to support the emerging HRT program and its projected growth.
- The HRT program should address the demand for quality students, educated and trained on the breadth of interests in horticultural science, so that they are positioned to drive industry and science forward.
- Maintain the vibrant student Horticulture Club with a succession plan to ensure strong departmental involvement.
- Engage with the College Office of Philanthropy and Alumni to create endowments to support recruitment scholarships and enhance the number of additional merit-based academic scholarships for students in the major.
- Ensure that an effective "pipeline" is in place for students to articulate/transfer from community colleges/regional universities to Horticulture and develop a plan to effectively integrate them into the existing student community.
- Use conventional and emerging horticulture stakeholders to assist the department in an advisory capacity.
- Use FFA and other secondary education oriented programs to increase interest in the HRT undergraduate degree program.
- Work with industry leaders to develop a vibrant, industry-funded student internship program where all HRT majors would be required to do at least one internship to graduate.
- Consider hiring 1 – 2, non-tenure track Ph.D.-level, full-time lecturers to add instructional expertise and capacity (especially for freshman/sophomore courses), enhance student advising capacity, club supervision and to facilitate greater industry engagement in conducting career classes, internship development and coordination, and capstone projects.

## Research

### Strengths

- A strong research program covering a diversity of critical focus areas.
- Researchers are highly skilled in their research focus areas.

### Challenges

- Physical distance between research locations and office spaces on campus limits collaborative efforts among researchers and between research faculty, Extension faculty, and staff.

**Opportunities/Recommendations**

- Increased communication to facilitate collaborative and applied research projects with Extension associates.
- A significant opportunity exists to capitalize on horticulture's role in human diet and health.
- The department should ensure that the research enterprise can aid in the development of the emerging HRT program to address the breadth of interests in horticultural science and the demand for quality students that are positioned to drive industry and science forward.
- To facilitate idea sharing and collaboration within and outside the department, revitalize/create a vibrant, regular departmental seminar series to include current faculty research updates, graduate student presentations (research proposal, final seminar), Extension program updates/impacts, invited speakers from industry (e.g., successful alumni), and invited scientist guests (collaborators, national leaders, etc.).
- Actively engage graduate students in faculty search/hiring processes to facilitate their professional development and provide constructive input in the hiring process.
- Actively promote department-supported opportunities for graduate students to pursue professional development beyond attending scientific conferences (e.g., attending grant-writing workshops, certified pesticide applicator training, etc.).
- Involve graduate students in planning/implementing departmental social events that can highlight the cultural/ethnic diversity represented.
- Develop research lines that could aid in both conventional and emerging industries. (Note: this opportunity is based on feedback from the stakeholder and industry listening session.)

## Extension

**Strengths**

- Diversity of knowledge base covers a wide array of community needs and interests.
- Extension faculty and staff are highly responsive to queries from staff, Extension Agents, and clientele providing high quality information and assistance.
- Extension agents, both Horticulture and Agriculture and Natural Resources, require and are highly interested in assistance from the department.
- Clientele recognizes the importance of the department, and have a desire for the department's Extension mission to continue to address the needs of conventional horticulture industries, emerging organic growers, landowners of all sizes, and rural and urban audiences. All stakeholders recognized the importance of the department to their enterprises and have a strong interest in supporting the department's development.

**Challenges**

- Limited capacity for developing Extension programs that can address both conventional and emerging horticultural production systems and specific focus areas such as horticultural weed science.
- Several key Extension publications are out-of-date and some emerging horticultural crops and production techniques are not covered by UK publications or resources.

- In the face of faculty retirements, there is concern over faculty continuity and replacement specifically to support stakeholder needs in arboriculture and fruit production.
- Limited support for horticultural weed science.
- Current website structure is difficult for the public and Extension staff to navigate and efficiently find resources.
- A number of Extension staff are on extramural support leading to uncertainties about continued servicing of critical stakeholders.
- Perceived lack of support for conventional horticultural operations.

**Opportunities**

- In collaboration with county agents, update a number of key publications and proactively develop new resources to address emerging horticultural crops and production systems (ex. organic production).
- Develop Extension strategies and programs that improve county agent ability to address critical issues, including:
    - development of train-the-trainer programs in home, conventional and emerging commercial industries,
    - development of resources that county agents could use for clientele education, and
    - engagement of county agents in research and outreach to industry.
- Develop programs that ensure effective relationships between the department and county agents.

## Administration

**Strengths**

- Staff, faculty, and stakeholders mention appreciation of the open and inclusive leadership style of current chair.
- Strong faculty desire to support planning for strategic changes and succession planning.
- Service projects are strongly supported and have good engagement from the entire department.
- The current chair is viewed as having the concern, passion, and ability to provide appropriate leadership to facilitate and navigate the change process.
- The department is recognized as being good at what they do, freedom is provided to complete tasks as needed, and diversity is viewed as a strength.
- Morale seems positive and professional development is fostered and encouraged.
- Staff is interested and believes there is value in improved communication between Extension and research.

**Challenges**

- Proximity issues on-campus and with the HRF, Arboretum, Princeton, and RCARS represent a barrier to communication and relationship building between staff and department administration, and has led in some instances to a disconnect with staff and the department.

- Perception that farm safety issues are not adequately addressed or appreciated resulting in a lack of proactive reporting. Extramural funding sources, and funding in general, is a critical issue for the HRF. Some farm infrastructure is aging or in need of upgrading (ex. internet service) and securing sustainable funding for operations and staff is critically needed.
- The rapid change of the horticultural industry results in a need for continuous engagement with clientele and stakeholders to ensure needs are known and addressed.
- The diversity of horticultural operations in the state and region, the need to maintain relevant and impactful research enterprise, and the emergence of the HRT program requires a high degree of balance among outreach, teaching, and research efforts. There is a risk of loss of knowledge from impending faculty retirements that could be a threat to servicing stakeholders.
- Threats from budget erosion and KHC funding can potentially derail department momentum if critical soft funded Extension and technical positions are lost.
- There is a concern for succession planning that ensurescontinued and sustainable funding for Extension staff.

**Opportunities**

- Development of a philanthropic plan, in collaboration with the CAFE Office of Philanthropy and Alumni to engage alumni and stakeholders in fundraising strategically aimed at addressing department needs including HRF, endowment funded student scholarships, support for undergraduate research projects, study abroad trips, graduate fellowships, travel grants for students to present at scientific conferences, other sponsored projects, etc.).
- Impending faculty hires provide an opportunity to increase gender diversity within the department faculty.
- Mechanisms, such as incentivizing post-retirement appointments, should be explored to limit the loss of corporate memory and expertise with impending retirements.
- The department is poised to make significant advancement if it has the ability to develop successful strategic and succession planning for impending faculty retirements. There is a palpable sense of optimism about the future. The department can work closely with college/university facilitators to develop departmental strategic and succession plan based on self-study, external view and on-going input from extension agents, associates, specialists, students, industry stakeholders, and alumni. Hiring faculty is the key to maintaining relevance in the university and CAFE and, if leveraged appropriately, can lift the industry and horticultural interests throughout the state.
- The development of a strategy to improve communications and actively engage critical industry stakeholders has the potential to result in positive support for the department. Strategies include:
    - Creation of Industry Advisory Committee representing diverse stakeholders/alumni by regular engagement and listening (Identify strategic supporters/alums with capacity to create opportunities for students, invest in department priorities, etc.)
    - Regular/periodic means of communication with stakeholders detailing important research updates and other departmental events that can be vital to facilitate transparent communication and account for programmatic efforts.

- Develop communication resources (ex. weekly or monthly email) to efficiently and effectively provide departmental updates for all staff and faculty and consider social events to provide opportunities for constructive relationship development.
- Creation of annual (or 2x/yr) Horticulture fellowship event.
- Develop a means for staff to proactively report farm safety issues that is:
    - easily accessed,
    - provides comfort for staff engagement, and
    - is responsive.
- Establish a sustainable funding model for P.I. led research at the HRF including user fees, revenue generation through services provided, produce sales, hosting events, etc.

# UK Program Review Implementation Plan

*This **required** form is described as Appendix A in AR II-I.0.6.*

**College/Unit:** Horticulture **Date:** 12/21/21

| Recommendation/ Suggestion | Source I/E/H* | Accept/ Reject** | Unit Response (resulting goal or objective) | Actions (including needed resources) | Time Line |
|---|---|---|---|---|---|
| 1. **Develop a sustainable funding model for the Horticulture Research Farm (HRF).** (CAFE Strategic Plan Goals 3 and 5)<br><br>● Develop a business plan specifically outlining costs by focus area and alternatives for sustaining income streams.<br>● Consider philanthropic funding options aligned with departmental development efforts (see recommendation 6).<br>● Industry sponsored projects that contribute to operating costs and student support are desirable and should be considered. Explore implementation of a user fee policy (such as plot fees) to contribute to farm | E/I | A | An operating budget and business plan will be developed for the HRF based on expenses across all input areas. This will be broken down into operating cost paid by the college and/or the department.<br><br>Once developed, the business plan will be separated based on costs associated with each focus area. This will be compared with outputs and impacts from each focus area to better understand returns on investment for departmental and college resources. The goal of this cost and impact assessment is to better guide resource allocation at the farm.<br><br>The Chair will work with departmental faculty and the college Philanthropy staff to identify funding opportunities.<br><br>Industry funded research and product | The Chair will work with the Farm Manager and departmental Business Officer to obtain the necessary information needed to develop the operating budget and business plan. This will be presented to the faculty.<br><br>The Chair will work with departmental faculty and staff to determine outputs and impacts from focus areas on the farm.<br><br>Once developed, the operating budget and business plan will be presented to the CAFE administration to assess whether the departmental operating budget could be increased based on need.<br><br>Access to donor lists from CAFE Philanthropy, or guidance on identifying appropriate donors will be needed.<br><br>CAFE Research Office support will be needed for contract development. | 2022<br><br>2022<br><br>2022<br><br>Ongoing<br><br>Ongoing |

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| operating costs. | | | testing will be pursued. It will be critical that these projects are done in a way that does not negatively impact existing research and extension activities.<br><br>A plot fee system will be developed and implemented. | Plot fees have been discussed numerous times and will be finalized and implemented based on guidanace from the Farm Users Committee. | 2022 |
| **2. Implement a formal reporting method for farm safety considerations, which ensures utility for all farm participants and timely administrative response.** | E | A | Standard operating proceedures (SOPs) will be developed across a range of equipment and facilities. This will be made available to existing and new staff and faculty. A system for reporting safety concerns will be developed and will include a tracking component that will document responses and actions. | The Chair will work with the Farm Manager, faculty, and farm staff to identify and develop appropriate SOPs and a reporting system for safety concerns. | 2022-ongoing |
| **3. Implement regular internal departmental communications to facilitate collaboration and understanding of departmental needs, priorities, and outcomes.** (CAFE Strategic Plan Goal 3)<br><br>Suggestions for achieving this recommendation include:<br><br>● Revitalize/create a vibrant, regular departmental seminar series to include current faculty research updates, graduate student presentations | E/I<br><br>E | A<br><br>A | Strategies for increasing internal departmental communication will be identified and implemented.<br><br>A regular departmental seminar series will be developed. | The Chair, with faculty and staff input and involvement, will lead the development of a new departmental website. This will include the development of an internal webpage that contains SOPs and information critical to faculty, staff, and student success.<br><br>The Chair will implement regular staff meetings similar to the monthly faculty meetings. In these meetings, departmental needs, priorities and outcomes will be addressed. Minutes from these meetings will be posted on shared drives.<br><br>The Chair will work with faculty | 2022-ongoing<br><br>2022-ongoing<br><br>2022-ongoing |

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| (proposal, final seminar), extension program updates/impacts, invited speakers from industry (e.g., successful alumni), and invited scientist guests (collaborators, national leaders, etc.).<br>● Weekly or monthly "digest" email with submissions from faculty, staff, and students as a communication method for current events and sharing successes. | E | R | Faculty and staff meetings will be used to highlight successes and current events. The departmental website will be redeveloped to better highlight successes. The departmental listservs and shared drives will be better utilized to maximize communication. | to identify the best strategy for creating a sustainable approach for developing a seminar series. The structure, timing and implementation will be identified based on faculty input and commitment.<br><br>Actions as noted to the left. | |
| **4. Implement effective plan for regular, transparent communication with external audiences including industry stakeholders, Extension agents, and engaged public**. (CAFE Strategic Plan Goal 2)<br><br>Suggestions for achieving this recommendations include: | E | A | A plan will be developed to increase and optimize communication with stakeholders, Extension Agents and the engaged public. | The Chair will work with departmental faculty to identify and document current efforts to communicate with stakeholders. Strategies will be developed to increase communication. Examples could include yearly seminars or meetings with industry partners such as the KY Horticulture Council. Existing newsletter and CCD postings will be evaluated to assess impact. | Ongoing |

| | | | | | |
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| ● Create formal, regularly scheduled (e.g., semi-annual) meetings with key stakeholder groups, including industry, Extension agents, alumni, and engaged public. This could be accomplished by attending meetings normally being held by stakeholder groups.<br>● Invite external audiences to departmental seminar series (see recommendation 3).<br>● Develop a method for regular communications with external audiences. | E<br><br>E<br><br>E | A<br><br>A<br><br>A | See above.<br><br>See above.<br><br>See above. | Current involvement with stakeholder groups will be assessed and an effort to maximize communication through regular updates at meetings will be implemented. This will be done through the Chair and appropriate faculty. These efforts will be documented to allow yearly assessments and trends.<br><br>Industry and public partners will be invited to present at departmental seminars. Industry representatives will be involved in departmental retreats.<br><br>Current communication approaches will be assessed and documented and modifications will be made based on faculty, staff, and external stakeholder input. Impacts of these efforts will be documented. | Ongoing<br><br>Ongoing<br><br>Ongoing |
| **5. Develop a strategic plan, including a succession plan to address faculty retirements and potential loss of expertise and stakeholder relationships in a manner that maintains** | E/I | A | A strategic plan for guiding the development of the department based on faculty and staff retirements and succession will be created. This will include an assessment and adoption of each of the committee's suggestions for strategic plan development and implementation, as appropriate. | A departmental faculty retreat will be held in early 2022 to develop a strategic plan for guiding future hiring of faculty and staff. Decisions will be based on current and future departmental needs across all mission areas and will take into account critical issues such as funding opportunities, | 2022-ongoing |

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| **balance among outreach, research and instruction and supports diversity and inclusion initiatives.** (CAFE Strategic Plan Goals 3, 4, and 5)<br><br>The following suggestions are potentially useful in strategic plan development and implementation.<br><br>• Use national research funding trend data to assess priority areas for recruiting.<br>• Use departmental aggregate DOE portfolio to balance mission area effort with overall department goals for use in recruiting new faculty.<br>• Conduct needs and opportunity assessment of research, Extension, and instructional programs.<br>• Consider faculty and Extension staff cluster hiring and opportunities for interdepartmental and inter-college collaborations.<br>• Explore multi-state Extension hiring opportunities. | | | | DOE, P&T, world and national trends, UK and CAFE trends such as CPM 2.0, DE&I, and ways to address stakeholder needs. This process will result in a strategy and plan for hiring new faculty and staff as well as resource allocation towards each of the mission areas. | |

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| **6. Work with the college Office of Philanthropy and Alumni to construct a development plan to engage alumni, stakeholders and partners, aimed at developing scholarships, endowments, named professorships, etc. for the department's programs and facilities.** (CAFE Strategic Plan Goal 1 and 6) | E | A | A development plan will be created to strategically increase contributions to departmental endowments, named professorships, programmatic support, etc. | The Chair and select faculty and staff will continue to work with the Office of Philanthropy to identify support opportunities and interact with key stakeholders, alumni, and area partners. The Chair will work with the faculty to identify areas of need and develop appropriate strategies to secure support. As the Horticultural Science undergraduate program is further developed, potential industry and private donors will be identified and approached for contributions. | Ongoing |
| **7. Develop strategies and resources to provide effective recruiting for the HRT program and develop critical student services including retention, internships, and job placement. (**CAFE Strategic Plan Goals 1 and 4)<br><br>Among options to consider would be the hiring an Academic Coordinator or other appropriate position to facilitate the following:<br><br>● Leverage industry partnerships to recruit, train and place students in | E<br><br>E | A<br><br>A | Strategies to to increase student enrollment and support for the HRT program will be developed. Emphasis will be placed on developing sustainable advising approaches, internships, and job placements. Additionally, faculty and staff involvement in the HRT program will be assessed to determine future classes and instructional opportunities.<br><br>The potential cost and benefits of hiring an academic coordinator will be assessed. This will potentially include the possibility of hiring a joint coordinator between the HRT | The Chair will work with the Director of Undergraduate Studies (DUS) and the departmental teaching committee to identify critical needs for increasing student enrollement and success in the HRT program. This will include identifying instructional, recruiting and advising needs. Additionally, emphasis will be placed on increasing internship opportunities, scholarships, and tracking job placement.<br><br>The DUS of the HRT and SAG programs, along with steering commitees and departmental teaching committees will be involved in this assessment. | Ongoing<br><br>Ongoing |

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| internships and graduates in careers.<br>● Continue to support the activities of the Horticulture Club and leverage activities for academic program recruitment and retention.<br>● Investigate options for development of formal pipelines from community college programs.<br>● Collaborate with college Director of Diversity and Inclusion to identify and implement diversity initiatives in recruiting. | E<br><br><br><br><br><br>E<br><br><br><br>E<br><br><br><br>E | A<br><br><br><br><br><br>A<br><br><br><br>A<br><br><br><br>A | and SAG programs.<br><br>A strategy for increasing industry connections and internships will be developed. Increasing industry scholarships will be part of this effort. The goal will be to optimize job placement for our graduates.<br><br>A sustainable management, funding and growth plan will be developed for the Horticulture Club. This will be done through the club directors and the Chair.<br><br>Pipelines from community colleges as well as highschools will be identified and developed as appropriate.<br><br>Optimizing ways to increase diversity initiatives in recruiting will be assessed and implemented. | Resources from the college may be needed to achieve this goal.<br><br>The DUS, teaching committee, and faculty will work to identify opportunities for new internships. New internships will be created as appropriate. Opportunities are increasing in areas such as controlled environment agriculture (CEA), arboreta and botanic gardens, and programs housed in our department such as SAG and DWBS.<br><br>Preliminary efforts are already being developed to create pipelines from community colleges and highschools for students interested in CEA. This will be expanded as appropriate.<br><br>The CAFE Office of Diversity will be utilized to develop strategies for optimizing DE&I messaging and efforts in recruiting and all others aspects of our undergraduate program. | Ongoing<br><br><br><br><br><br>2022-2023<br><br><br><br>Ongoing<br><br><br><br>Ongoing |
| **8. Explore diversified funding opportunities in collaboration with the Kentucky Horticulture Council (KHC).** (CAFE Strategic Plan Goals 3 and 5) | E | A | Communication between the Chair and KHC Executive Director will be increased. This approach will be used to better identify industry needs and ways that our department can best interact and support the industry. All aspects of the KHC grant to our department will be assessed. | Meetings between the Chair, select faculty and the KHC Executive Director have been increasing since the review committee site-visit and are providing excellent opportunities for improvement in structuring Extension Associate efforts and departmental interaction. The KHC Executive | Ongoing |

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| ● The Department Chair and KHC Executive Director, who represents industry stakeholders statewide, should meet to discuss industry priorities and expectations, as well as departmental opportunities, student outcomes, program implementation and accountability. This meeting should take place in advance of the KHC report submission or other agreed upon interval. | | | | Director will present the state of the industry at our faculty retreat to help inform hiring decisions and resource allocation. Opportunities to better manage the KHC grant are being identified and changes made based on feedback from the Exectiuve Director. This iterative process is already resulting in changes in accountability and impact assessment for grant and Extension Associate management. Enhanced communication will be emphasized moving forward. | |
| **9. Restructure department website for improved user experience and develop social media platform to support all mission areas.** **(**CAFE Strategic Plan Goal 2)<br><br>This should focus on, but not be limited to:<br><br>● Improve website accessibility of departmental publications.<br>● Highlight work done by departmental students, research and Extension. | E/I | A | A new website and social media platform will be developed. The website will focus on increasing communication to external audiences as well as our internal community. | Internal or external resources will be utilized to redesign our website based on faculty, staff and stakeholder input. This effort will also be extended to develop internal communication webpages for new and existing faculty, students and staff. These webpages will contain critical information on SOPs and departmental policies and practices.<br><br>To be successful, protocols for submitting information such as publications, and success stories will be developed and will need departmental support and commitment. | 2022-ongoing |

*** Source of Recommendation (I = Internal recommendation; E = External Review Committee recommendation; H = Unit Head recommendation)**
**** Accept/Reject Recommendation (A=Accept; R=Reject)**

**Unit Head Signature:** Mark Williams **Unit Head Supervisor Signature:** Nancy M. Cox **Date 2/7/2022**