

University of Tennessee Knoxville and Tennessee State University Combined Research and Extension Plan of Work 2020-2024

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I. Plan Overview

1. Executive Summary

Tennessee's two land-grant institutions comprise the Tennessee Agricultural Research and Extension System. They work independently and collaboratively to conduct Research and Extension programs in all 95 counties and to serve the state's 6.7 million people. The University of Tennessee is based in Knoxville and serves as the state's 1862 institution. It includes the University of Tennessee Extension (UT Extension) and the Tennessee Agricultural Experiment Station (UT AgResearch). Based in Nashville, Tennessee State University is the state's 1890 institution; it includes the Tennessee State University (TSU) Cooperative Extension Program and the TSU Institute for Food, Agriculture and Environmental Research. This 2020-2024 Plan of Work represents the combined efforts of UT Extension, UT AgResearch, the TSU Cooperative Extension Program, and the TSU Institute for Food, Agriculture and Environmental Research.

UT Extension conducted a far-reaching strategic planning effort in 2010 to map the future for the next 10 years. The planning process was guided by a diverse leadership team representing a cross-section of employees from across the state, including TSU, and this team was instrumental in collecting and analyzing data. As part of this process, we sought opinions from many Tennesseans, including decision-makers, clientele, partners and volunteers. Nearly 1,000 local Extension stakeholders attended one of 10 area meetings where they discussed Extension priorities and community needs. The planning effort also included an online survey where more than 2,000 Tennesseans shared their opinions. The goal was to give everyone a voice. This extensive strategic planning effort informed this Plan of Work.

TSU has appointed Program Leaders in family and consumer sciences, 4-H youth development, agricultural sciences and natural resources, and community resource and economic development to provide linkage with program areas between UT and TSU. These appointees also serve on the TSU Extension Programming Council to coordinate integrated and interdisciplinary programming efforts.

Almost one of every five dollars generated in the state is associated with agriculture or an industry that generates projects from a natural resource - more than \$60 billion annually. In addition, nearly 300,000 Tennesseans are directly employed by agricultural or natural resource industries, making effective research and Extension programs critical. UT and TSU research foci include supporting the state's nursery industry; developing agronomic crop varieties to meet consumer and farmer needs; improving the reproductive health of our livestock; concerted efforts to ramp-up biomass production and processing to reduce dependence on foreign oil; and expanding the state's important hardwood lumber processing industry. In addition, we seek to continue our leadership in no-till agriculture and soil erosion modeling; become more adept at using beneficial insects to protect ecosystems in the Great Smoky Mountains and beyond; explore new technologies to for sustainable agriculture and food systems; and contribute to the national public policy conversation through our agricultural and natural policy research centers. We also will continue to safeguard the public with important food safety research, promote technologies to minimize wastewater impact, and explore the juncture of animals, humans, and the environment. TSU research plans to continue to increase our impact through the addition of position in plant biotechnology and food science.

UT AgResearch conducts research within its seven academic departments and seven physical centers (in addition to several virtual centers), and at ten AgResearch and Education Centers located throughout the state. These units help drive planned research programs and facilitate the faculty's research projects. This Plan of Work is the first to include two newly-formed centers – the University of Tennessee Institute of Agriculture (UTIA) Genomics Center for the Advancement of Agriculture which focuses on genomics and beef cattle and seeks to advance agriculture by developing new strategies to increase productivity and improve sustainability of food production systems, and the Center for Agricultural Synthetic Biology which focuses on agricultural sustainability by modifying DNA to create more sustainable agricultural products.

The College of Agriculture at Tennessee State University utilizes faculty in the Department of Agricultural and Environmental Sciences and the Department of Human Sciences to conduct research to address the needs of our society, with particular emphasis on underserved populations and the NIFA priority areas. Our goal is to pursue new frontiers in agricultural research that are relevant to our stakeholders. In addition to our network of campus-based laboratory and research facilities, our faculty utilize three agricultural research and education centers to support their research. Utilizing NIFA funding, TSU research is entering the construction phase of a new stand-alone food science and technology building to support our expanding expertise in food safety.

This Plan of Work includes estimated FTEs, merit/peer review processes, methods to obtain and utilize stakeholder input, and the critical issues that drive research and Extension priorities at the University of Tennessee and Tennessee State University. Stakeholder input and statewide needs assessments may result in a shift of allocations and FTE assignments between and among planned programs (critical issues) from year to year.

2. FTE Estimates

Year	1862 Extension	1890 Extension	1862 Research	1890 Research
2020	450.0	90.0	250.0	80.0
2021	450.0	90.0	250.0	80.0
2022	450.0	90.0	250.0	80.0
2023	450.0	90.0	250.0	80.0
2024	450.0	90.0	250.0	80.0

II. Merit / Peer Review Process

Tennessee Extension programs funded by Smith-Lever or NARETPA Section 1444 and 14445 require a merit review process. A panel of Extension administrators, program leaders and scholars from four states reviewed and approved the Tennessee Extension merit review criteria. Criteria includes assessing needs, delivery methods, implementation steps, evaluation, ensuring diversity and defined outcomes. UT and TSU coordinate merit review processes. State Extension specialists propose planned programs. All proposed programs are reviewed and approved by a review team of UT and TSU administrators and specialists.

UT AgResearch Hatch regular and Hatch/Multi-state research projects also undergo a review process for merit and scientific soundness, and to ensure that they align with established research priorities. The review process for Hatch regular research projects begins informally with discussions between the project director, colleagues, the department head, and, if applicable, AgResearch and Education Center administrators where any work may take place. A review panel of three scientists evaluates the proposal for clarity and scientific merit (that should lead to publishable data). The project director makes any necessary changes then submits the proposal to the department head. If approved, the Dean/Director of AgResearch then conducts a final review and approves the proposal for submission to NIFA.

Hatch/Multi-state projects go through a comparatively more complex review at the regional level, so the internal review process is abbreviated. The faculty member officially joins a multi-state project after consulting with colleagues and, if applicable, the AgResearch and Education Center administrators where work may take place. He/she then submits a project proposal reflecting the UT component directly to the Associate Dean/Associate Director of AgResearch. The researcher may submit the project to NIFA once the review is complete and any necessary changes are made.

Each TSU planned outcome has been peer-vetted by an associated faculty focus group and the college administration. Some programs have the benefit of an additional review by an external panel. These panels are composed of agricultural researchers and administrators in the 1890 University system. Faculty proposals within the Critical Issues are evaluated for relevance, scientific soundness, and appropriateness of planned outcomes. Only those proposed programs that successfully meet all criteria are developed into executable outcome objectives.

The TSU College of Agriculture continues to hold an annual retreat for faculty. This two day, off-campus event provides an

opportunity for focus group members to dedicate time to discuss, evaluate, and plan program objectives without the distractions of campus life. Also, the Associate Deans of the college continue to have individual meetings with faculty members monthly. These meetings facilitate an almost continual avenue for monitoring of progress and problem resolution. These procedures contribute significantly to ensuring that projects under the Critical Issues are executed efficiently and with maximum benefit to stakeholders.

III. Stakeholder Input

1. Actions to Seek

UT and TSU Extension pursued multiple data collections for this Plan of Work. All 95 counties have local Extension advisory groups that provide ongoing stakeholder input. The UT-TSU Extension State Advisory Council reviews and updates plans bi-annually. Extensive strategic plan activities also informed this plan. Employees, community members and state agency leaders participated in surveys, listening sessions and focus groups to identify critical issues affecting their communities and how Extension could address these concerns. Based on this input, the State Extension Advisory Council identified plan priorities. New state action agendas were created to address priorities. Plans are reviewed annually to determine progress and make changes.

UT AgResearch continues to seek stakeholder feedback through several means.

- Three UTIA Regional Advisory Councils meet twice per year to discuss agricultural and natural resources issues, UTIA program priorities, and how UTIA, including UT AgResearch and UT Extension, may respond to these issues.
- UT AgResearch continues its successful partnerships with commodity and industry groups, the Tennessee Farm Bureau, and several departments within the Tennessee state government to advance common research interests.
- Advocacy/advisory groups serve each of the seven UT AgResearch academic departments and the ten AgResearch and Education Centers at the invitation of the department head and Center director, respectively, to provide stakeholder feedback and to guide future research priorities.
- Faculty help drive the UT AgResearch agenda by remaining abreast of emerging research and actively engaging with the scientific community, program leaders with state and federal funding agencies, the general public, and agricultural and natural resources commodity and industry groups.

TSU research places a very strong emphasis on our faculty to be members of, and adopt service/leadership roles in, the industry/trade/commodity/professional organizations associated with their research. Through the development of relationships with the leadership and members of stakeholder-related organizations valuable stakeholder input is gained.

Examples of associations in which our faculty have enhanced roles of engagement are the: Southern Nursery Association, Tennessee Soybean Board, Tennessee Cattlemen's Association, Amaranth Institute, Tennessee Organic Growers Association, Tennessee Nursery and Landscape Association, SE Branch-Entomological Society of America, International Plant Propagator's Society, Tennessee Goat Producers Association, and the Tennessee Urban Forestry Council.

In addition to private groups, our faculty regularly engage public agencies to provide guidance and feedback about our programs. Agencies include the Tennessee Department of Agriculture, Tennessee Department of Forestry, Tennessee Plant Material Advisory Committee, Tennessee Wildlife Resources Agency, Tennessee Department of Environment and Conservation, USDA APHIS, USDA ARS, USDA FSA, USDA FS, USDA NRCS, and USDA RMA. A number of different programs maintain an active presence on social media (Facebook, Twitter) and utilize feedback gained from those sources.

2. Methods to Identify

UT and TSU Extension will employ their extensive, statewide network of advisory groups for stakeholder input. The State Extension Advisory Council provides input and direction for statewide initiatives. Tennessee Extension Agents will continue to place special emphasis on involving youth and other underrepresented groups in needs assessment activities.

In FY 2018, UT and TSU Extension made 6,080 contacts for needs assessment purposes. Statewide needs assessment methods included:

73 advisory committee meetings
74 open listening sessions
140 focus groups
1264 surveys

All of Tennessee's 95 counties have a County Agricultural Committee of seven local stakeholders, nominated by the County Mayor and approved by majority vote of the County Commission. Every County Agriculture Committee meets four times annually, and their duties include input into hiring decisions, local funding, and local programming.

UT AgResearch implements several methods to identify stakeholders for input. Three UTIA Regional Advisory Councils are comprised of the UTIA Chancellor and Deans, representatives from Tennessee agricultural and natural resources commodity groups, and clientele served by UTIA programs. UTIA personnel nominate the commodity group and clientele members. Each of the three Regional Advisory Groups elects a chair to guide meetings. In addition, UT AgResearch administrators and faculty are actively engaged with agricultural and natural resources commodity and industry groups. As new priorities arise, these groups seek out one another to discuss common research priorities and opportunities for partnership. Advocacy/advisory groups for the UT AgResearch academic departments and the AgResearch and Education Centers identify additional stakeholders based on the individuals' and groups' relevant background, expertise, and community connections, etc. UT AgResearch faculty regularly interact with their peers at professional meetings and through joint project ventures. UT AgResearch administrators encourage faculty to meet with program leaders at state and national funding agencies to discuss research priorities. Additionally, faculty have opportunities to meet with the public during AgResearch and Education Center field day events.

TSU research does not employ a single defined strategy to identify stakeholders, rather our goal is to identify stakeholders in a manner that will provide the most useful and accurate feedback possible about stakeholder concerns. Groups that serve the stakeholders (community based groups) or groups that represent stakeholders (industry and trade associations) are a primary source of input. Examples of groups are listed in the previous section, Actions to Seek Stakeholder Input. Individual stakeholders are utilized where there are no associated groups representing the program area, or when an opportunity for face-to-face interaction (i.e. at an association meeting, field site visit, or community event) is presented. In these cases, individuals involved the program outputs are identified and queried for input.

3. Methods to Collect

Tennessee Extension Agents and Specialists are trained in needs assessment strategies and how to select individuals for Advisory Committees. Community leaders selected for Advisory Committees are chosen to represent the diversities (i.e., gender, age, racial/ethnic, socio-economic, political, educational, etc.) of the county or area served. Extension Agents recruit individuals who have participated in past and current Extension programs; and they recruit individuals who have not used Extension to serve on local advisory committees and participate in open listening sessions.

UT AgResearch collects stakeholder input through meetings and regular communication with stakeholder groups. The UTIA Regional Advisory Councils meet twice per year for face-to-face meetings. The UTIA Chancellor responds to any issues that the Councils raise, and, as appropriate, may delegate action to the Deans/Directors of UT AgResearch and UT Extension. UT AgResearch administrators meet with external stakeholders throughout the year. They have face-to-face meetings with the academic department heads and virtual meetings with the AgResearch and Education Center directors every month. Collectively, these three groups meet annually. The UT AgResearch academic departments and AgResearch and Education Centers meet with their advocacy/advisory groups annually, and share stakeholder feedback with AgResearch administrators and faculty as appropriate. Faculty attend professional meetings and read scientific journals and popular press articles throughout the year. Departments hold monthly faculty meetings where individuals have the opportunity to share their insights with peers and their department head.

Most stakeholder input for TSU research is collected in either face-to-face discussions, interaction with commodity groups, or via survey instruments. Each of these methods are effective. The face-to-face discussions are often held with individual stakeholders, community group representatives or trade association representatives, or with individual stakeholders in a group setting. This allows for questions and answers to direct and stimulate discussion of areas of importance to stakeholders. Survey instruments are a useful tool to assess information from broader groups of stakeholders. Our nursery research programs regularly employ surveys of producers to solicit feedback on important issues; surveys for feedback on individual topics are also used following informational talks at educational programs, field days, etc. While

some stakeholders prefer the anonymity and brevity of a survey instrument (often resulting in increased level of input gained), a survey instrument does not always allow for discussion of previously unrecognized areas of concern. The increased acceptance of social media has also presented opportunities for stakeholder input. A number of our programs maintain an active presence on social media and these platforms serve as a source of information on stakeholder needs and concerns. All research presentations to non-academic stakeholders now solicit feedback via evaluations. The information gained from these surveys is incorporated into program focus areas.

4. How Considered

Created from stakeholder input, the State Extension Strategic Plan for 2010-2020 identifies emerging issues, redirects Extension programs, builds state action agendas and sets program priorities. Stakeholder input and performance measures at the local, regional and statewide level monitor and adjust deployment of the strategic plan. Modifications of this plan based on stakeholder input include:

- Increasing urbanization and a loss of farmland in the state are concerns for residents. Our Nursery, Fruit and Vegetable Production Programs will place greater emphasis on plant, pest, and soil diagnostic services. Fruit and vegetable programs will stress proper variety selection. We are already seeing results from this change with nursery growers increasing revenue and savings by over \$700,000 in FY2015.
- The Center for Profitable Agriculture has conducted educational programs for several years on the state's Agritourism industry. Via surveys and advisory group meetings, programs will include marketing value-added beef, optimizing farmers' markets, and increasing grants for local food initiatives.
- Health issues continue to be top concerns for residents. Extension strengthened health programming by offering the CDC Diabetes Prevention Program. This intensive program has demonstrated effectiveness in preventing adults diagnosed with prediabetes from developing diabetes. The program will continue to be expanded in the next year.
- To strengthen our Extension and research for the state's beef cattle producers, the Beef and Forage Center based at the University of Tennessee will continue to integrate research and Extension efforts in beef cattle. Researchers and Extension personnel will jointly implement research and outreach in hay schools, late gestation nutrition, marketing, forage testing, and stockpiled forages.

Stakeholder input is an active part of setting UT AgResearch budget priorities and redirecting allocations as critical needs emerge, are addressed, and wane. Stakeholder input directly impacts hiring patterns, faculty equipment budgets, scientific communication efforts, forward-looking action plans, and grant-writing directions.

TSU Extension will continue to use extensive stakeholder input to determine what extension faculty positions and extension agent positions are needed for the state of Tennessee. TSU Extension will also continue to partner with UT Extension, county extension offices and extension advisory councils to determine staffing needs, emerging issues and determine priority areas for the State of Tennessee.

As previously stated, TSU research utilizes stakeholder input during the planning and execution of research programs. Information gained through this process did not result in any overt changes in research direction or scope this past year. Rather, it provided information on additional facets for research exploration. For example, in discussions with nursery growers about alternatives to the potentially banned chlorpyrifos, plans to included dip treatments were removed from consideration upon emphatic feedback on the practicality of such treatments. These new, or additional information changes, are the sorts of stakeholder-inspired modifications we encounter most frequently.

IV. Critical Issues

1 Supporting Food, Fiber, and Energy Systems

Description:

Safe, sustainable agricultural systems that are socially, economically, and environmentally responsible are key to enhancing the lives of Tennesseans and supporting a growing global population. We are exploring ways to deliver discoveries using a systems approach to agriculture productivity that will provide customizable solutions for producers.

Term: Long

Science Emphasis Areas

Agroclimate Science
Bioeconomy, Bioenergy, and Bioproducts
Environmental Systems
Family & Consumer Sciences
Food Safety
Human Nutrition
Sustainable Agricultural Production Systems

2 Enhancing Biodiversity and Environmental Quality

Description:

Safeguarding and enhancing the natural resource environment has become increasingly complex within environmental, social, resource and personal contexts. Through collaboration among researchers, industry, producers, environmental groups, and government, we are helping preserve a diverse and resilient environment for future generations.

Term: Long

Science Emphasis Areas

Agroclimate Science
Bioeconomy, Bioenergy, and Bioproducts
Environmental Systems
Sustainable Agricultural Production Systems

3 Enriching Our Economy

Description:

Helping farms and agriculture businesses become more profitable and individuals become financially secure boosts the local, state, and national economies. Our programs strive to strengthen the economic viability of all facets of agribusiness, and improve the financial literacy of Tennesseans and beyond so they may build and protect wealth for themselves and future generations.

Term: Long

Science Emphasis Areas

Family & Consumer Sciences
Food Safety
Sustainable Agricultural Production Systems
Youth Development

4 Developing Our Workforce

Description:

A key component for thriving communities is a strong workforce in rural and urban areas. Tennessee's programs for youth and adults provide the skills, experience, and confidence necessary to move into a competitive workforce and solve present and upcoming challenges. Through outreach and engagement, we also educate youth to better understand the vital role that agriculture and animal industries play in people's lives and the career opportunities these industries provide.

Term: Long

Science Emphasis Areas

Education and Multicultural Alliances
Family & Consumer Sciences
Food Safety
Sustainable Agricultural Production Systems
Youth Development

5 Strengthening Our Health

Description:

Making healthy choices is important for humans, animals, and even our planet. As a leader in nutrition, animal welfare, and environmental education, we are working to understand how food, physical activity, and social connections affect overall health (i.e. One Health). From food safety to disease prevention and maintenance to the state of our environment, these efforts will help Americans and the rest of the world lead healthier lives for generations to come.

Term: Long

Science Emphasis Areas

Environmental Systems
Family & Consumer Sciences
Food Safety
Human Nutrition
Sustainable Agricultural Production Systems
Youth Development