

University of Illinois Combined Research and Extension Plan of Work 2021-2025

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I. Plan Overview

1. Executive Summary

The University of Illinois at Urbana-Champaign

The University of Illinois at Urbana-Champaign is charged by our state to enhance the lives of citizens in Illinois, across the nation, and around the world through our leadership in learning, discovery, engagement, and economic development. Our strategic vision is that the University of Illinois will strive to be the pre-eminent public research university with a land grant mission and global impact. We define pre-eminence as: (1) We will be the best at what we do; this is a matter of excellence in achievement; (2) We will have impact locally, nationally, and globally through transformational learning experiences and groundbreaking scholarship; and (3) We will be recognized by our peers as leaders. We will be visible to the nation and world – this is the leadership expected from a world-class university with a land-grant mission.

The College of Agricultural, Consumer and Environmental Sciences

Everything we do in the College of Agricultural, Consumer and Environmental Sciences (ACES) is designed to improve the quality of life of the people in the state of Illinois, across the nation, and around the world. We discover, develop, translate, and disseminate knowledge to address societal concerns and train the next generation of experts and leaders in a way that empowers them to expand the boundaries of science to higher levels of understanding and influence.

We are an interdisciplinary community of scholars and learners, spanning life sciences, social sciences, and engineering, committed to addressing societal challenges related to food, agriculture, environmental sustainability, and human wellbeing. Approximately 1,500 people work in ACES, including 180 tenure-system faculty and 65 specialized faculty FTE and nearly 700 University of Illinois Extension employees. Our student body consists of 2,800 undergraduate and 745 graduate students.

ACES is changing to meet the challenges of our time and the realities of our situation. We are making strategic investments of cash and recurring resources to capture opportunities that support our discovery, education, and engagement missions. At the same time, we are emphasizing performance criteria across units for enrollment, research productivity, and return on investment in our budget management processes. Our strategic intent is to lead in our university and among our peers with vibrant approaches to fulfill our land-grant ideals.

Identification of Primary Strategic Opportunities for the College of ACES

Opportunities for ACES align with the four main goals in the campus and college strategic plans. They serve as a platform for initiating efforts, from the modest but remarkable, like our seed grant programs, to the audacious, for example changing the Extension model and the building of a new Feed Technology Center (a twenty million dollar facility that will serve as a national hub for new discoveries and advancement in animal management, nutrition, and production).

Goal One - Foster Scholarship, Discovery, and Innovation

Knowledge generated and brought to bear to meet grand societal challenges emerges from ACES scholarship. As highlighted by University of Illinois President Timothy Killeen's speech to the Board of Trustees, we are on the cutting edge of photosynthesis discoveries, carbon capture, and biofuels, among others. We inform solutions for these challenges, while creating exceptional opportunities for students, as well as economic and social value for stakeholders. We contribute excellence to the University of Illinois in critical areas of discovery and learning by creating resilient, sustainable agricultural, food, energy, and social systems, by influencing positive responses to climate change, by ensuring greater food security in Illinois and around the world, by achieving gains in wellness and health care through human development and nutrition, and by regenerating land and water resources for current needs and future generations.

Many areas of distinctive opportunity exist for scholars in ACES, ranging from the intensive application of data sciences in our domains, to increasing the photosynthetic efficiency of crops; from the innovative application of synthetic biology in food systems, to the possibility of improving human health through personalized nutrition; or from the ability to precisely characterize feed ingredients, to the humane husbandry of food and companion animals. Among a host of other opportunities, we are positioned well to inform innovative strategies for managing the effects of climate change, engineering scalable bio-product technologies, and influencing policies to mitigate substance abuse.

The Discovery Partners Institute (focusing on workforce development and applied research in the Chicago area) and the Illinois Innovation Network (a system of connected university-community-industry-based hubs throughout the state working to drive innovation, economic development, and workforce development across Illinois) offer tremendous opportunities for ACES to catalyze interdisciplinary efforts, while we close the discovery-translation-transformation gap, rebuilding connections with stakeholders through modern approaches and technologies, and strengthening public and private relationships.

Goal Two - Provide Transformative Learning Experiences

Our most significant opportunity begins with reaching new and larger markets for students, including new high school graduates, transfer students, and continuing education students. As we redesign curricular offerings, we anticipate that demand will increase for ACES majors and courses. There is a large, expanding opportunity to develop effective online educational programs for undergraduate, graduate, and professional students. A 2015 USDA study found that graduates from programs like ours could only fill about 61% of related career opportunities.

Goal Three - Make a Significant and Visible Societal Impact

ACES significantly impacts society every day, through our teaching and research, and perhaps most visibly through our Extension activities with the public. By strengthening Illinois Extension as the primary educational engagement interface between campus, communities, and stakeholders, we can activate new portals of access to benefit the entire university. Better positioning Extension to serve as a connector between campus and communities will catalyze transformational learning that is vital to improving the quality of life of people around the state and beyond.

We also see opportunities to foster existing and new collaborations with institutions, communities, and stakeholders and expand our network locally and globally. As a fundamental responsibility, we should be making vibrant connections to activate our support communities and inform relevant policymaking. To do so requires that we communicate effectively "What we do, and why it matters" internally and externally to influencers, stakeholders, and community members. Those messages are reaching audiences through a fully redesigned marketing communications strategy and structure, redesigned websites, and the implementation of a marketing playbook. We intend to attract the finest students and scholars to Illinois and engage stakeholders who will manifest our vision.

Goal Four - Steward Current Resources and Generate Additional Resources for Strategic Initiatives

ACES will continue to lessen our dependence on state funding by diversifying revenue streams, reducing costs, and

generating deliverables with high rates of return. Strategically investing ACES resources is intended to maximize our strengths, align with the campus plan, and enhance return on investment. That includes strategic investment of gift funds and USDA capacity funds.

New ways to diversify and expand the funding portfolio include creating high-value online educational programs, increasing paid-tuition enrollment, tapping international resources, securing grant resources with higher overhead income, and building corporate and private partnerships and agreements.

The University of Illinois Cooperative Extension Service

University of Illinois Extension remains the university's premier means of educational outreach to the public. Although it is centrally budgeted, Extension resides in the College of ACES and reports to the Dean. Preparing for the new, redesigned federal plan of work, Extension initiated a statewide assessment process which revealed five critical issues and thirteen associated state priority targets for interdisciplinary outreach and engagement. At the college level, the Extension 3.0 Task Force (comprised of external and internal stakeholders convened by Dean Kimberlee Kidwell) released recommendations to reinvigorate the bi-directional connections between research and Extension and move toward a more digitally-driven approach to outreach and engagement. Concurrently, Dr. Sharon Nickols-Richardson, in her role as Associate Dean and Director of Extension, led an intensive visioning process to align Extension in the College of ACES with a statewide public engagement initiative within the University of Illinois. In FFY2019, Chancellor Robert Jones unveiled a five-year strategic plan for the University of Illinois at Urbana-Champaign in which one prominent goal is to "Empower University of Illinois Extension to differentiate itself from other state Extension networks by focusing on societal grand challenges, to balance its efforts to address rural and metropolitan needs and issues, and to collaborate with faculty and staff across all colleges to have a higher impact." Extension is poised to launch into this next plan of work with support and vision from leadership at all levels. We are tooling up our data systems to align with the requirements of the new reporting systems under development.

The University of Illinois Agricultural Experiment Station / Office of Research

The ACES Office of Research is a support unit that enables and encourages creativity of and interdisciplinary collaboration among the highly talented faculty advancing the mission of the college. The OR accomplishes this through investments in seed funding, equipment, and infrastructure; maintenance of offsite research stations; federal grants administration; training opportunities; listening sessions; and strategic partnerships.

The University of Illinois Agricultural Experiment Station (AES) comprises a statewide network of research facilities, farms, and forests that allow Illinois scientists to tackle the world's most critical issues. The College of ACES oversees a \$24 million federally funded AES research portfolio, including nation-leading work to improve photosynthesis and crop production efficiency; maximize animal and human nutrition; protect and restore natural resources; and support families and communities across the state and the globe. Hundreds of studies are underway in 90,000 square feet of greenhouse space and across more than 5,000 acres, demonstrating our commitment to transformational science and practical solutions.

Currently ongoing initiatives include FIRE (Future Interdisciplinary Research Explorations) grants (these are competitive seed grants designed to support outside-the-box ideas to solve critical problems in our mission areas; major goals of the FIRE program are to develop cross-disciplinary partnerships and to initiate research that will attract large federal grants); providing support for infrastructure and facilities (the Office of Research has just awarded its second round of funding for new research equipment; many investments are matched by the Dean's Office to purchase equipment needed to start new lines of research); and participation in interdisciplinary centers (including the Center for Digital Agriculture, the Institute for Sustainability, Energy, and Environment, and the Center for Advanced Bioenergy and Bioproducts Innovation).

2. FTE Estimates

Year	1862 Extension	1862 Research
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2021	260.0	225.0
2022	260.0	235.0
2023	260.0	245.0
2024	260.0	250.0
2025	260.0	255.0

II. Merit / Peer Review Process

Research and outreach projects and programs have always been subject to a review process. Capacity-funded research projects undergo a merit review process at the departmental level to insure the projects are scientifically sound, relevant to society's needs, and not duplicative of efforts undertaken elsewhere. Departmental reviews may be conducted by the department head, by internal and/or external peers, or by a standing department research committee. The Office of Research then works with investigators to insure that the REEport submission is correctly completed. Projects are then submitted to NIFA for final review and approval. Internal research grants are all reviewed internally.

Extension state program leaders, working with staff on their respective teams, have been charged with the responsibility for ensuring that Extension programs are research-based. In most cases, local programs and curriculum will be developed by more than one educator and reviewed by several of their peers who have the same assigned specialized areas of delivery. Curriculum materials are often sent for review directly to peers in other states and 4-H curriculum materials are often sent through a national jury process. In addition, annual staff performance reviews include criteria to assess demonstration of programming quality through evaluation findings. Finally, the merit of all new program efforts and a selected number of ongoing programs are evaluated by participants regarding content and delivery.

III. Stakeholder Input

1. Actions to Seek

All programs in the college are continually subjected to a diverse process of stakeholder input. The college, the Office of Research, the Office of Extension and Outreach, academic departments, and many programs within the college have advisory groups and councils made up of stakeholders. In this context, stakeholders may represent organized entities in the state with a particular interest in a program area, but they also include individual stakeholders. In addition to stakeholder input provided through formal means such as advisory groups and councils, college administrators, educators, partners, students, and alumni all play roles in seeking out stakeholder input (for example, the college hosts the Explore ACES open house in March). The ACES Office of Marketing Communications actively pursues opportunities to build public awareness with the aim of recruiting and engaging new students, faculty, donors, and other stakeholders. The team disseminates and tracks college promotional material, including news about novel research, through a curated list of local, regional, and national media outlets, as well as social media platforms, digital ads, email, and print pieces.

At the state level, members of the Extension State Advisory Council (ESAC) are recruited to reflect the geographic and programmatic diversity of the Extension organization. In addition, state program leaders, specialists, and faculty seek opportunities to connect to state and regional stakeholders in their speciality areas. Locally, unit directors and staff devote time and attention to recruit and support local Extension Council members who provide advice on educational programming and priorities. Unit leaders submit annual reports that monitor the race, ethnicity and gender of their volunteer leadership to regularly assess need for more targeted actions to engage underrepresented stakeholders. Additionally, Extension field staff have a deep and broad network of partners who are consulted in efforts to expand offerings, reach new audiences, and maximize impact. The statewide Program Planning and Assessment Committee members reflect a diverse array of internal stakeholders representing a wide variety of roles and all regions. Each member serves a two-year term to assure that insights and input are continually refreshed.

2. Methods to Identify

ACES administrators, researchers, and educators seek to interact with as diverse a group as possible to identify groups and individuals who can provide input that insure that ACES research and outreach remains relevant to their needs and concerns. These groups range from student recruiting and instruction (reaching out to the next generation of scientists and educators), to fellow researchers and Extension specialists (both in Illinois to identify stakeholders focusing on local

issues and beyond to identify stakeholders focusing on issues of regional or national concern), to growers and those who are direct recipients of Extension programming, to commodity groups, lawmakers, and industry.

As part of the University of Illinois Extension Affirmative Action plan, county Extension directors and Extension educators identify individuals to serve on formal local multi-county, regional, and state advisory groups for Extension. These groups play a key role in identifying research and Extension priority activities, as well as suggesting others who should be contacted. In addition, Extension staff members network and establish relationships with individuals and groups in assigned areas to assess priority needs. Extension staff will need to continue those efforts in the coming years in order to sustain local funding. An adhoc group of Extension unit directors and educators was convened in 2018 to identify current and potential external stakeholders as an action that emerged from the Extension 3.0 Task Force report. Extension administrators at the regional and state level also network with internal and external individuals and groups and regularly use these contacts to seek suggestions for expanding stakeholder engagement.

3. Methods to Collect

The Associate Dean for Research (Dr. Germán Bollero) places a high priority on identifying stakeholders and collecting input in a variety of ways (building on the many relationships with stakeholders Dr. Bollero had already developed as head of the Department of Crop Sciences). Input was sought from a wide spectrum of stakeholders, including local farmers, commodity groups, corporate partners, regional, state, and national legislators, and leaders and scientists from other academic institutions. The College of ACES Office of Marketing Communications will continue to solicit comments through news releases, publications, and broadcasts. Extension faculty and staff use a variety of formal and informal methods to gather stakeholder input on needs, program content, and methods of delivery. Formal methods include surveys of program participants through end-of-program surveys and of local stakeholders and partners to assess needs, priorities, and opportunities. Other formal methods include discussions with multi-county Extension Advisory Council members and with local and state organization leaders and groups. Efforts at the department level will continue to include one-on-one conversations, surveys, workshops, and extending invitations to specific groups and individuals to serve on advisory committees. Field days, the Explore ACES open house, and events hosted by the Office of Advancement are examples of recurring efforts to collect stakeholder input.

4. How Considered

Continuation, redirection, or initiation of new research and Extension programs draws heavily on stakeholder input from formalized groups and various needs assessment methods. Stakeholders play a critical role in identifying currently-unmet needs in research and outreach programs, and their input is used to sharpen the research priorities of college departments and to insure that publications, Extension programs, and other outreach efforts are focusing on those areas of greatest concern to stakeholders. The State Extension Program leaders will continue to meet with multicounty Extension educators to identify priority programs to be delivered and those programs not addressing high-priority areas will be discontinued.

Stakeholder groups including industry partners, alumni, local and State Extension Advisory Council members, and Extension Partners (a grassroots group formed to support Extension) members will continue to be influential in expressing research and Extension needs to local, state, and federal government officials responsible for restoring, continuing, or increasing funding for research and Extension that can be used in budgeting, allocating or reallocating funds, and identifying needed faculty and staff expertise.

IV. Critical Issues

1 Economic and Workforce Development

Description:

Population projections show that rural Illinois will face serious challenges in the next decade and beyond, with population declines, shrinking young population cohorts, and increasing proportions of elderly that may retire and/or move out of Illinois, closing many small businesses that have provided essential services for many years. Additionally, the per capita personal bankruptcy filing rate in Illinois is ranked the 6th worst in the nation. Enhancing our understanding of the interplay of economic, social, and environmental dynamics (including the

impact of economic development initiatives, agricultural markets, and causes and consequences of population decline in rural areas) will help communities and legislators develop and promote effective economic development policies. Overarching goals include enhanced economic vitality of small business and agricultural production operations, increased workforce preparedness and advancement, and increased financial wellbeing among residents (particularly those most vulnerable to poverty).

Term: Long

Science Emphasis Areas

Bioeconomy, Bioenergy, and Bioproducts
Family & Consumer Sciences
Sustainable Agricultural Production Systems
Youth Development

2 Community Involvement, Inclusion, and Leadership

Description:

Illinois' population is diverse in terms of demographics, economics, population density, and cultural norms. Many communities and their leaders need assistance with identifying strategies to address the rapidly changing social and economic landscape. Communities where people feel connected, have a sense of belonging, and appreciate the strengths of diversity are more likely to experience lower rates of violence/conflict and a higher quality of life. Because civically engaged youth are more likely to contribute to their communities as adults, there is an ongoing need to create these opportunities. Research and Extension activities can play a pivotal role in discovering and translating practices to promote strong leadership, volunteer opportunities, and supportive social community networks. Primary overarching goals include preparing youth to thrive, increased connectedness, diversity, equity, and inclusion within communities and systems, and increased engagement and involvement of community members and leaders to create local solutions for local challenges.

Term: Long

Science Emphasis Areas

Education and Multicultural Alliances
Family & Consumer Sciences
Youth Development

3 Thriving Natural Resources

Description:

Natural resources and functioning ecosystems are essential to the sustainability and growth of human enterprises from agriculture to recreation. Innovative solutions to protect soil and water quality are grounded in research on cropping systems level solutions, such as cover crops, and edge of field technologies such as wood chip bioreactors that scavenge and immobilize excess nutrients from crop production. People of all ages and abilities enjoy higher levels of health and well-being when they have access to nature in the form of parks, gardens, greenways, and natural landscaping. Research and Extension activities will contribute to the identification, promotion, and adoption of policies and practices that support thriving natural resources in Illinois communities and beyond. Overarching goals include promoting engagement with home and community landscapes and enhancing preservation and protection of natural resources in shared, public spaces.

Term: Long

Science Emphasis Areas

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

4 Safe, Plentiful, and Accessible Food Supply

Description:

As the world-wide demand for animal protein is expected to double in the next thirty years, our research will play a critical role in providing animal protein through production systems that are environmentally sustainable and socially acceptable. Research in crop sciences supports food security through four main areas of activity: plant improvement, plant protection, production management and ecology, and data acquisition and analysis. About one of every nine Illinois households experience food insecurity and the rate has been on the rise over the past ten years. We seek to develop and disseminate technologies to improve food production, to create novel processing and handling strategies to control food pathogens, and to develop and promote access to nutritious food for the population. Overarching goals include reductions in food insecurity, increased safety of food across the supply chain, and enhanced food production capacity among residents and growers.

Term: Long

Science Emphasis Areas

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

5 Safe, Healthy Environments and Behaviors

Description:

Nationally, about 86% of annual health care spending is related to chronic disease and 80% of premature heart disease, stroke, and type two diabetes diagnoses could be prevented through healthy lifestyle choices. Research and Extension activities will target a range of personal, social, economic, and environmental factors that influence health status. Work will also focus on reducing negative health outcomes and health disparities that limit quality of life. In addition to physical health, we will focus on issues important to Illinois families such as substance abuse, social and economic inequalities, and interpersonal challenges. Research and Extension activities will focus on surfacing and addressing trends as they emerge in order to promote health and wellbeing among Illinois citizens. Overarching goals include prevention and management of chronic diseases, promotion of social and emotional health outcomes, and both creation and maintenance of safe and healthy environments that support healthy decisions.

Term: Long

Science Emphasis Areas

Education and Multicultural Alliances
Family & Consumer Sciences
Human Nutrition
Youth Development