

University of Illinois Combined Research and Extension Plan of Work 2020-2024

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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. Nearly 1,500 people work in ACES, including 189 tenure-system faculty and nearly 700 University of Illinois Extension employees. Our student body consists of 2,629 undergraduate and 679 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.

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. This is an exciting time to be part of Extension. Preparing for the new, redesigned federal plan of work, Extension initiated a statewide assessment process in FFY2017 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 in FFY2018 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. Finally, 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.

The University of Illinois Agricultural Experiment Station / Office of Research

Exceptional research with high impact is core to our identity as a research university. ACES research mission aligns with the IAES, a state-federal investment in research on the forefront of discovery, balanced with application, relevant to Illinois’ food, agricultural, environmental, and human interests, and impactful for the world’s scientific community. Some 250 scientists contribute to our diverse and impressive portfolio. Our research and education facilities provide a vital testing-ground where research can generate data and practical applications to benefit consumers, producers, interest organizations, public agencies, and businesses.

The Illinois Agricultural Experiment Station [IAES] is a subsidiary unit of ACES with a statutory federal mission. IAES represents the federal-state research partnership, funded in part by capacity-building funding from the National Institute of Food and Agriculture [USDA/NIFA] and matched by state investment.

Importance of Hatch Funds

The funds provided to support research through the Hatch Act provide basic capacity funding for the State Agricultural Experiment Stations. Hatch funds allow the Illinois station to fund translational research capacity that allows us to turn discoveries into tools and technologies that farmers, livestock producers, and other stakeholders can use, they support strategic investments in research initiatives of importance to Illinois stakeholders, they enable targeted research efforts balanced between discovery and application as well as between long-term and short-term outcomes, and they provide critical seed funding for faculty research efforts that lead to further competitive and private-sector support. Hatch funds are used to support the four stations of the Illinois Research and Education Network [the Dixon Springs Agricultural Center [research includes observation trails of various vegetable crops in both hydroponic and in-ground raised bed production systems within high tunnels, beef cattle reproductive physiology, forest ecology, soil health, forestry policy, and invasive species control], the Urbana-Champaign campus South Research Farms [the farm is approximately 1,100 acres and is used to site several animal production units such as the Beef and Sheep Research Field Laboratory as well as over 800 acres used for forage/grain production and research], the Orr Center [the center’s research covers a wide variety of crops and beef research, including beef cattle nutrition and management and soil fertility and tillage systems], and the Northwestern Illinois Agricultural Research and Demonstration Center located near Monmouth [projects include soil chemistry and fertility, soil management, crop production, weed science, entomology, plant pathology, pest management and environmental quality]].

Hatch funding also supports the Family Resiliency Center [<http://familyresiliency.illinois.edu/>] and the Program in Ecology, Evolution and Conservation Biology [PEEC prepares individuals for research and teaching careers in ecology and evolutionary biology and produces scientists who are both technically competent and broadly educated in ecology and evolutionary biology]. Hatch funding also supports the identification and development of high-yielding biomass crops for sustainable energy production, improvements in crop production through breeding, genetics, and pest management, better stewardship of our forests, watersheds, and other natural resources, programs focusing on human health and development [such as obesity, nutrition, and child development], and work to better insure the availability of a safe and secure food supply for all Americans.

Importance of Smith-Lever Funds

During times of uncertainty regarding state funding for the university and for Extension, Smith-Lever allocations have been critically important in sustaining Extension’s capacity to address priority issues that are global, national, and statewide in scope. When state funding was reduced or eliminated in the recent past, the requirement that Smith-Lever funds be

matched provided an incentive for local stakeholders to sustain their local funding ensuring that Illinois Smith-Lever funds are allocated.

Smith-Lever dollars continue to serve as an important resource in supporting actions to more efficiently maintain issue-relevant program delivery through current and emerging technologies to reach a broad segment of our population. In addition, Smith-Lever funding enables access to resources to maintain a staff presence throughout the state essential in meeting the needs of limited resource audiences who need personal supportive interaction in addressing health issues such as child obesity and food security. Smith-Lever funds are also very valuable in ensuring that Extension can address priority issues through support to initiate innovative responses. The flexibility provided by Smith-Lever funds also allows Extension to continue to support successful grant-funded programs that address priority issues after the grant funding is no longer available and to be responsive to emerging trends and needs.

The Critical Issues

Community Involvement, Inclusion, and Leadership

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.

Economic and Workforce Development

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.

Thriving Natural Resources

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.

Safe, Plentiful, and Accessible Food Supply

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.

Safe, Healthy Environments and Behaviors

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.

2. FTE Estimates

Year	1862 Extension	1862 Research
2020	250.0	210.0
2021	250.0	210.0
2022	250.0	210.0
2023	250.0	210.0
2024	250.0	210.0

II. Merit / Peer Review Process

Research and outreach projects and programs have always been subject to a review process. Formula-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. Formula projects are then submitted to NIFA for final review and approval. Internal research grants are all reviewed internally. Greater detail on the specific Hatch review processes conducted by individual departments within our college is included in the Annual Report.

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 the 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 ExplorACES open house in March].

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. Annual reports are submitted to compile Civil Rights data for each units volunteer leadership to regularly assess need for more targeted actions to seek 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 standing 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

A variety of methods and techniques are used to identify individuals and groups, with several specific examples discussed in detail in our Annual Report. These examples include activities conducted by the dean and associate deans, Extension administrators and educators, and departments within the College of ACES.

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 traditional and non-traditional internal and external individuals and groups and will use these contacts to seek suggestions for other key stakeholders that can be contacted to provide direction for research and Extension.

3. Methods to Collect

As mentioned in our Annual Report, the Associate Dean for Research [Dr. German 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 has already developed as head of the Department of Crop Sciences]. 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 ExplorACES 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