Arizona (University of Arizona)

Plan of Work for 2023-2027

Status: Final (Approved 9/29/2022)

Executive Summary Overview

Like all organizations around the world, The Arizona Experiment Station and Arizona Cooperative Extension will be dealing with the impacts of COVID-19 for many years to come. The pandemic has forced us to re-think how we deliver our programming, content, and other offerings to our stakeholders across the state. Fortunately, we're already skilled in delivering and communicating science and bringing it to bear on practical problems. We have also focused some of our diverse research capacity on key issues related to understanding COVID-19 etiology, monitoring, detection and prevention. We're an organization that has been responsive to changing environments and adapting to challenges. We anticipate many challenges in addressing our critical areas of helping to build sustainable, profitable, and competitive food and fiber systems; natural resource conservation; health, safety, and economic security; quality youth engagement and programming; and preparation of future solutions.

Many challenges shape the future of Arizona agriculture. Over the next decade, Arizona agriculture will be challenged by international competition, environmental regulation, changes in technologies and the food and fiber production chain, and increased risk related to changing climate and reduced water availability- this changing landscape offers new research and Extension opportunities. We expect these challenges to be met through both individual management decisions and the actions by government, land grant colleges, and grass roots groups of agricultural producers. National, state and county budgets are a challenge which impacts the ability of the Arizona Cooperative Extension to meet stakeholders needs, and limited funding and diminishing grant opportunities are problematic but not impossible to overcome. In spite of the problems, it is important to note that the direct, induced and ripple effects of Arizona Agriculture provide overall impact of nearly 9 billion dollars into our rapidly growing state.

Arizona farmers have been and continue to be early adopters of new technologies, including laser leveling, drip irrigation, transgenic cottons, insect growth regulators (IGRs), and others. Informed, innovative farm managers, as well as price and yield incentives, helped spur this early, widespread adoptions. Thus, progressive farm management attitude and practices already in place will help assure the use and diffusion of new technologies in the next decade.

Technology is currently available to address many natural resource problems. To minimize adverse impacts on soil and water resources, ranchers will continue to conduct rangeland monitoring and adjust their livestock grazing systems. Specific methods are being developed to effectively demonstrate the benefits of instituting environmentally sound natural resource management programs. The Arizona Experiment Station and Arizona Cooperative Extension are leaders in this arena. The social, environmental, and economic benefits from these new practices need to be quantified and compared to the costs of not implementing these programs.

New developments in precision implements, communication, and computer technology promise to change some farming and ranching activities. For example, data from precision implements will be

analyzed and shared through on-line tools, permitting improved interaction between farmers and various other players in the food and fiber production system. GPS and GIS will be an important part of precision farming. Our relationship with NASA will build on the GPS and GIS activities and its practical application at the local level. Agribusinesses will be more closely linked by these technologies and provide inputs tailored to individual field and feedlot needs. Our Communications and Cybertechnology (CCT) Department within the Arizona Experiment Station has become national leaders in providing capacity for the conduct of research utilizing large amounts of data by standing up innovative solutions for researchers, developing impactful tools and interfaces to advance data science research across all of our areas of inquiry and information delivery. CCT also includes a renowned media production group that has developed powerful Emmy award winning video content that communicates key issues across our domains of inquiry.

Farms will continue to use more biotechnology, especially for managing pests. Bt and Roundup Ready cotton provide good examples of ways that biotechnology will help meet the challenge of long-run price declines and environmental challenges. For many years, the UA cotton management team has worked closely with growers in implementing the use of insect growth regulators and Bt cotton in their fields. Because of this program, there has been a 60% decline in pesticide spraying, resulting in a reduction of 1.6 million pounds of pesticides used. This has saved 142 million dollars and reduced damage by 11%.

An important area of continued inquiry are biotic and abiotic aspects of soil health. As temperatures rise and water restrictions increase, soils are coming under increasing stress. A vigorous area of inquiry focuses on the bacteria and fungi of the soil microbiome. A better understanding of how the microbiome interacts with and influences plant growth, and the potential deleterious effects of temperature and water restrictions, promise to provide important mitigation strategies for maintaining soil health and therefore agricultural production. Soil health monitoring is also an important focus through a statewide soil assessment. Collective actions will also affect farming in the next decade, perhaps even more so than in the past. At the federal level, economic policies seem on track to foster low interest rates, a crucial factor for capital-intensive agriculture, and a growing economy. Higher incomes will encourage demand for value-added and specialty agricultural products. Research and extension activities at the federal and state levels will provide information to reduce producer risk. At off-campus locations, the College of Agriculture and Life Sciences in conjunction with CCT will deploy new computer and communications-based technologies to increase and make scientific information more accessible to farm and agribusiness managers and employees.

Although it shows ups and downs, most of Arizona agriculture has prospered over the last ten to fifteen years by successfully meeting the challenges of declining real commodity prices, increasing input prices, serious pest problems, drought, and increasing government regulations. This capacity to meet challenges bodes well for the future.

We speculate that ten years from now, Arizona agriculture will have about the same number of very large farms producing most of the state's agricultural production, the dairy sector will continue to expand, ranching may decline somewhat, and cropped acreage will be at about its present level, although the acreage of individual crops may change over the years. Native American agriculture will likely increase with the availability of affordable water. More noticeable changes will occur in production technologies, the degree of vertical integration, and increased interaction with the international market.

Our family and youth programs will also experience change. In this era of federal deregulation and block grants to states, Arizonans have both the opportunity and the responsibility to cope with the gap in children's health care coverage, the tragedies of child abuse and neglect, the struggles of parents without job skills, and chronic diseases such as obesity and diabetes. There is clear evidence that community effort can help prevent teenagers from having babies, committing crimes, and dropping out of school. Healthier people are better able to contribute to a robust economy.

Fortunately, we have the tools we need to face these challenges. The risk indicators confirm that focused attention, money, and uninterrupted effort over time will produce good results. As a result of increased federal and state investment, more children now have access to quality preschool, and more parents are getting help in paying for child care.

Health issues remain a challenge. We have a long way to go to reach the point where every Arizona child has the opportunity to succeed. The rate of reports of child abuse and neglect needing investigation grew about 30% in the past 10 years. The rate of child deaths due to abuse or neglect nearly doubled during that time. And perhaps the most alarming statistic is the 25% jump in the percentage of Arizona children living in foster care. These are the most vulnerable children in our communities, growing up without the security of a stable family. The challenge of our program is to provide unique research-based university outreach efforts in partnership with local and state government as well as non-governmental organizations to address these crises conditions.

Merit and Scientific Peer Review Processes

Proposal development, submission and evaluation follows a rigorous established process. Faculty are encouraged to discuss and develop proposal concepts with colleagues and the Experiment Station Associate Director. Faculty whose proposal ideas address a stakeholder need and align with Experiment Station guidelines are asked to submit a full proposal. A review panel consisting of at least three faculty members with USDA grant review experience and relevant expertise is appointed by Experiment Station Associate Director. The committee reviews the proposal according to the following criteria: 1) overall merit relative to the goals of the relevant federal capacity program and the needs of Arizona stakeholders; 2) scientific and technical merit 3) relevance of proposed outcomes to stakeholder needs. The committee prepares a consensus review and makes one of three recommendations: 1) approval as submitted; 2) approval subject to revision and resubmission; 3) disapproval. Written comments including recommendations for improving the proposal, if appropriate, are provided to the PI. Revised proposals are reviewed by the committee and the Associate Experiment Station Director, and if approved are submitted for NIFA final evaluation.

Stakeholder input: Action Taken to Seek Stakeholder Input

This plan will continue the long-standing integration between research and extension with appropriate input from stakeholders and below are some of the actions planned:

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups,
- Targeted invitation to traditional stakeholder individuals,

- Targeted invitation to non-traditional stakeholder individuals,
- Targeted invitation to selected individuals from general public,
- Survey of traditional stakeholder groups,
- Survey of traditional stakeholder individuals,
- Survey specifically with non-traditional individuals

This year, we have initiated a comprehensive needs assessment survey. This was launched recently and is inclusive of several internal and external stakeholders - the survey was put together by our Evaluation Specialist and her team. The survey is also being delivered in Spanish and is able to be collected electronically as well as in paper form. Something similar had been done nearly 10 years ago and the state has changed dramatically since.

Feedback from the survey will be closed at the end of October 2022 and the evaluation team will spend the next few weeks analyzing the data. We are looking to capture what the needs of Arizona communities are in this survey and begin to address. We're confident we currently have the expertise and capacity to address the needs, but this will enable us to know for certain and whether we find new critical issues to address.

In addition to the survey, we will continue to solicit input from stakeholders using traditional methods. Our personnel are constantly meeting with members of each community to ensure their feedback is collected about how we can support them as well as any emerging trends we need to take into consideration.

Stakeholder input: Methods to Identify Individuals and Groups

We will use the following methods to identify groups and individuals to collect input:

- Use Advisory Committees,
- Use Internal Focus Groups,
- Use External Focus Groups
- Open Listening Sessions Needs Assessments,
- Use Surveys

In addition to the above tactics and our recently-launched needs assessment, we have established a position to help us engage with our growing Spanish-speaking communities. This includes translating (or, trans-creating) any publications, web sites, or other resources that may of interest. This role is also leading up efforts to engage more with Tribal audiences from across the state.

Many of our current programs have relationships with other organizations and we rely on those relationships to stay aware of groups or individuals whom we would like to hear from and expose our offerings to them. With the focus on our social media, we've been able to "social farm" groups of similar interest and groups who could benefit from our programming. These groups include gardening, new/beginning farmers and ranchers, and youth development programs.

We've brought on some newer technologies that help us to keep track of current and former clients so we can continue to pulse and see what services they're interested in and what they need. We get lots of great feedback from them, especially our former clients, as we can make any adjustments to re-engage them to our latest offerings.

Stakeholder input: Methods for Collecting Stakeholder Input

Below are a few methods we plan to use for collecting stakeholder input:

- Meeting with traditional Stakeholder groups,
- Survey of traditional Stakeholder groups,
- Meeting with traditional Stakeholder individuals,
- Survey of traditional Stakeholder individuals,
- Meeting with the general public (open meeting advertised to all),
- Survey of the general public,
- Meeting specifically with non-traditional groups,
- Survey specifically with non-traditional groups,
- Meeting specifically with non-traditional individuals,
- Survey specifically with non-traditional individuals,
- Meeting with invited selected individuals from the general public,
- Survey of selected individuals from the general public, Other (Real-time assessment of programs and offerings)

As previously mentioned, a lot of our effort this year is in the needs assessment survey. But that doesn't mean it's the only method we will employ. Again, we utilize tried and true methods of engaging and collecting input from various stakeholders across the state as well as our internal constituents such as campus personnel, county-based personnel, and our volunteer networks.

We value the input provided by our clients, former clients, and prospective clients and partners. This is why we constantly solicit their feedback using in person discussions, surveys, town halls, and other methods. Many, if not most, of our programs offer a way to provide immediate feedback from program participants. We also have ways for clients to provide feedback online. We utilize this information to make changes. For example, if we receive feedback about one of our web pages, we're able to mobilize efforts to address those changes to better serve the clients' needs.

One service we provide is a plant clinic where trained and certified Master Gardeners provide responses to online inquiries from the general public. If a client is not satisfied with a response, we can escalate and have a specialist reach out to the client and address their need. In most cases, Master Gardeners are capable of providing adequate service.

Stakeholder input: A Statement of How the Input Will Be Considered

Stakeholder input is used by The Arizona Experiment Station and Cooperative Extension to help determine priorities and the need to establish new programs and possibly sunset others. Here are a few ways we plan to use and incorporate the feedback:

- In the Budget Process,
- To Identify Emerging Issues,
- Redirect Extension Programs,
- Redirect Research Programs,
- In the Staff Hiring Process,
- In the Action Plans,
- To Set Priorities

This year's needs assessment will be a major contributor to our Strategic Planning process which will kick off at the end of the 2022 calendar year. We've already commissioned an economic impact analysis and it will be joined with the needs assessment to complete our strategic plan. With the needs assessment, we will be able to better identify which programs work best in which communities. We can then start to throttle up or back as well as incorporate new programming.

Collecting, identifying, and analyzing stakeholder input is critical to the strategic plan. That's why, we've taken an approach of "go slow to go fast" with the needs assessment. We want to be sure it's capturing feedback from all pockets of the state. In the past, we relied on mostly our current clientele. With this needs assessment, we're able to collect information from other Arizonans who don't know about who we are and what we do – and how we can possibly help them in their daily lives.

Stakeholder input will help us to determine what is needed and what roles we need to create. We were fortunate to receive additional state funding this year and it's a great time to make any adjustments in our personnel and staffing capacity to ensure we're addressing the needs of Arizonans.

Critical Issues

A sustainable, profitable and competitive food and fiber system in Arizona

Initiated on: Nov 26, 2019
State: Arizona

Term Length: Long-term (>5 years)

Livestock production - to help livestock producers:

- Prevent potential threats by developing an early warning system to detect 1) new emerging diseases, 2) the resurgence of well-known diseases, and 3) the introduction of foreign animal diseases into the United States.

- Design management systems that fit an extensive range environment, including livestock production; genetics; nutrition; reproduction; economics; and grazing management.

Crop production - to help growers:

- Increase water use efficiency in irrigated crops.
- Use best management practices to enhance sustainable production of plants used for food, fiber, livestock feed, industrial products, and for environmental, aesthetic, recreational, conservation and ornamental purposes.

Urban horticulture - to help homeowners and landscape managers:

- Increase water use efficiency in home and commercial landscapes.
- Employ best management practices in the selection, installation, care and production of plants used for food, conservation, recreational and ornamental purposes.

Science Emphasis Area

Agroclimate Science, Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Food Safety, Sustainable Agricultural Production Systems

Arizona Youth focus and preparation

Initiated on: Nov 26, 2019
State: Arizona

Term Length: Long-term (>5 years)

Prepare Arizona youth to be productive citizens, equipped with the knowledg, skills, and attitudes needed for life-long learning and a positive future. Engage youth as participants and decision-makers in programs, organizations, and communities of 4-H and beyond. Promote the Arizona 4-H Youth Development program among diverse communities in Arizona.

Science Emphasis Area

Education and Multicultural Alliances, Environmental Systems, Family & Consumer Sciences, Youth Development

Enhance natural resource conservation and management

Initiated on: Nov 26, 2019
State: Arizona

Term Length: Intermediate (1-5 years)

Increase public awareness and understanding of water quality and quantity, watershed values, riparian areas, climate science and geospatial tools. Work with natural resource managers to improve management of rangeland and forest resources on a sustainable basis using best management practices.

Science Emphasis Area

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

Improve the health, safety, and economic security of Arizona communities

Initiated on: Nov 26, 2019
State: Arizona

Term Length: Intermediate (1-5 years)

Provide training to help Arizona residents acquire the knowledge, skills, attitudes and behaviors necessary for self-sufficient, healthy lifestyles. Equip youth and adults with work and life skills to help them acquire and keep jobs in today's workforce.

Science Emphasis Area

Agroclimate Science, Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Family & Consumer Sciences, Food Safety, Human Nutrition, Youth Development

Prepare Arizonans for solutions of the future

Initiated on: Nov 26, 2019
State: Arizona

Term Length: Long-term (>5 years)

Work with university specialists on innovative approaches to current problems as well as problems which we can't anticipate yet. Facilitate training and programming to introduce our communities, especially our youth, to help prepare them for jobs that don't even exist yet.

Science Emphasis Area

Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Family & Consumer Sciences, Sustainable Agricultural Production Systems, Youth Development