

Report Status: Approved as of 07/19/2022

Contributing Organizations

University of Arizona

Executive Summary

Overview

Consistent with higher education and community outreach all across the country, we continue to do more with less. Despite limited appropriated financial support, we continue to make a difference, and are working to better balance our program areas with support.

- Arizona Cooperative Extension engages with people through applied research and education to improve lives, families, communities, the environment, and economies in Arizona and beyond. With offices in all 15 counties and on five tribal reservations, we bring knowledge to people every day to enhance their work and enrich their lives.
- The Arizona Agricultural Experiment Station stimulates learning through exploration and discovery to enhance agriculture, the environment, our natural resource base, family and youth well-being and the development of local communities. We accomplish this mission by the integration, dissemination, and application of knowledge in the agricultural and life sciences. Research is conducted in the various departments and schools on campus, as well as at Agricultural Centers throughout the state. Research generated through the Experiment Station underlies and supports the academic and extension programs.

Critical Issue: A sustainable, profitable and competitive food and fiber system in Arizona

Research and Extension activities in this Critical Issue include the below outcomes, among others:

- Through electronic updates, educational materials, workshops, meetings, and field demonstrations, AZ vegetable growers and PCAs have been exposed to new and timely information on insect biology, ecology and new IPM tactics in high value vegetable production systems. Our most significant activity has been the production and maintenance of an innovative outreach system for delivering timely and relevant information to our varied Arizona stakeholders and beneficiaries through our bi-weekly Vegetable IPM Updates Electronic Newsletter. During 2021, the Vegetable IPM Team delivered 25 email updates that provided new information to vegetable growers and PCAs. Currently we serve over 1000 state, national and international stakeholders with these updates (Distribution includes 95.3% USA, 2.2% Canada, 1.2% Mexico, 0.5% Germany and 0.5% other countries). These email updates contain detailed information on insect, weed, disease management along with market information that are presently important vegetable growers in Arizona, southern California and northern Mexico. Each update contained at least one electronic pdf document available on our website that contains timely research information or recommendations for addressing a relevant local pest problem. These updates have been sent to PCAs, growers and other agribusinesses every two weeks since January 2010. We have not missed a single update in 10 years.
- Every year the Extension activities in the precision agriculture program reach a number close to 500 growers, crop advisors, and agricultural chemical industry representatives. Adoption is happening at various rates, some users are applying new knowledge in site-specific management through their farm equipment.

Critical Issue: Arizona Youth focus and preparation

Research and Extension activities in this Critical Issue include the below outcomes, among others:

- In accordance with the University of Arizona Corporate Extension, results from this research will be disseminated through community workshops, presentations, research peer reviewed publications, and field trips. Possible target groups are as follows: Elementary Schools, Community Groups/Associations -University/College Classes, County Extension Offices, Watershed Associations, Master Watershed Stewards, Master Gardeners, 4-H. Additionally, research results and pertinent information will be compiled and conveyed through peer reviewed University Extension publications which are distributed within communities on a state-wide basis.
- We receive, on an annual basis, reviews from the teachers and also notes from students helping to evaluate our agricultural literacy programming at the Safford Agricultural Center. Results from these informal reviews have indicated much appreciation for the programming both from the students and the teachers. More importantly however, is the increased level of understanding in areas of crop production, biotechnology, water, and natural resource conservation, both on the part of the teachers and students.

Critical Issue: Enhance natural resource conservation and management

Research and Extension activities in this Critical Issue include the below outcomes, among others:

- An informal extension approach has been adopted involving a mix of community presentations, technical advising and funded projects and contracts focused on climate change communication and planning. I delivered several climate change talks in 2021 to watershed groups, farmers, water resource managers, private companies, and concerned citizens.
- Working with the Altar Valley Conservation Alliance and the Natural Resources Conservation Services (NRCS) to investigate rock structures for enhancing soil fertility. Rock structures are an ancient approach for slowing water movement and enhancing germination by providing favorable microsites (Nichols et al. 2012). This technique is not supported by formal studies despite its enormous potential for restoration. This technique is particularly relevant for AZ ranchers as it requires no soil disturbance and therefore, no costly cultural resource site surveys. We have deployed a series of rock structures to assess their value in reducing erosion, enhancing soil fertility, and increasing native plant cover. Although this project is only in its first year, we have already hosted five field days on this work.

Critical Issue: Improve the health, safety, and economic security of Arizona communities

Research and Extension activities in this Critical Issue include the below outcomes, among others:

- A coalition of community leaders has been formed and meets monthly; a website has been established to serve as a clearinghouse of physical activity opportunities; city wide activity events are held; forums are held for local businesses to engage them in employee wellness efforts.
- Improved awareness, knowledge, and consideration of risks associated with pests, pest management options, IPM benefits, including disinfectant use in indoor school environments. Increased use of reduced hazard management options, healthier school and home environments, reduced exposure to pests and pesticides.

Critical Issue: Prepare Arizonans for solutions of the future

Research and Extension activities in this Critical Issue include the below outcomes, among others:

- CEC outreach to tribal communities has reached thousands of tribal members and has increased the knowledge of mining impacts on tribal people and lands and contributes to informed decision making for tribes regarding tribal activities and exposure. We especially highlight a special issue "Water in the Native World" that was recently published featuring papers about water challenges facing tribes where Indigenous scientists and community members, and students lead and are involved in addressing the challenges. This special issue was highlighted in a series of webinars that reached 428 people via zoom. In average there were 71 attendees per meeting. A poll found 99% of attendees found the webinar somewhat relevant for the work they do and more than 90% of attendees rated the quality of the webinar very good to excellent. The recordings of the entire series were uploaded to the UA SRC channel shortly after each webinar and have reached 233 people on YouTube by July 20, 2020. In addition, we highlight CEC efforts to respond to COVID-19. Three workshops held to highlight co-innovation with Indigenous communities to address food, energy and water insecurities especially those amplified by COVID-19. We have also been able to provide a series of tribal presentations, videos, and community-based research projects that are responsive to COVID-19 impacts on tribal communities.
- 238 professionals know how to inspect an onsite wastewater treatment system for the Arizona Transfer of Ownership Inspection Program. Without taking this course, these professionals would not have been eligible to participate as an inspector for the statewide program. Thus, 238 professionals either expanded their business model or were able to continue conducting business in this area. A national exam is required to demonstrate knowledge.

Updates

Arizona Cooperative Extension will utilize a multi-pronged approach to the merit and scientific peer review processes. These include updated software to facilitate the workflows, meeting with internal and external university panels, an improved onboarding process for new faculty/staff, and overall better communications. Our goal is to streamline the process and ensure consistency across the state with general expectations and criteria. This has been an issue in previous years under previous administration and we're still seeing impacts. But as many of the more-senior faculty age out of the system, we are shifting our focus to the newer personnel and getting them acclimated to our updated processes.

As for our merit process, much of that continues to be dependent on the activities of the college and the university - not to mention our continued funding. Because we're on a separate line item on the state budget, being able to provide merit packages is highly dependent on us securing that state and federal funding every year. Once those are secure, we have to work within the guidelines of the college and university as well as faculty advisory councils to ensure our process is adopted and equitable. We do this in two ways: 1. we solicit names from our leaders on who in their departments they feel should be considered for merit and, 2. we run salary analyses to determine who should be considered for merit. Once we have names, we present to other Extension leaders and make decisions.

Utilizing newer technology platforms is one of the ways we will deliver on this. It's been done with disconnected forms and spreadsheets in the past, but updated platforms will allow us to drive consistency. Many of our publications go through a very thorough vetting from peer reviewers. The current software is limited and only allows for solid data entry. But in order to be able to facilitate better communication and quicker responses, we're incorporating a second platform. This will help with the e-submission processes to track reviews, approvals, printing, and publishing documents. We hope to expedite the process so that our faculty can have their work out to the public faster, especially during times of immediate need – such as pandemics where scientific information is sought out from the state.

Stakeholder Input

Actions to seek stakeholder input that encouraged their participation with a brief explanation

This plan will continue the long-standing integration between research and Extension with appropriate input from stakeholders and these 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

Methods to identify individuals and groups and brief explanation

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

Methods for collecting stakeholder input and brief explanation

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) *careful consideration with new social distancing; 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)

A statement of how the input will be considered and brief explanation of what you learned from your stakeholders

Stakeholder input is used by Cooperative Extension as well as the Arizona Experiment Stations for determination of priorities and establishment of programs. Here are a few ways we plan to use and incorporate the feedback: In the Budget Process; To

Highlighted Results by Project or Program

Critical Issue

Enhance natural resource conservation and management

[USA National Phenology Network: Supporting Management, Science, and Education](#)

Project Director

Theresa Crimmins

Organization

University of Arizona

Accession Number

1024898



USA National Phenology Network: Supporting Management, Science, and Education

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The consequences of changing phenology -- the timing of seasonal events such as leaf-out, flowering, migration, and egg hatch -- are wide-ranging, impacting ecosystem structure and functioning as well as human health, disease, economics, and society. The USA National Phenology Network (USA-NPN) is a national-scale monitoring and research initiative focused on collecting, organizing and delivering research-grade phenological data, information, and forecasts to advance global change biology and biodiversity research; to inform natural resource management and decision-making; and to promote understanding of phenology and the biosphere by a wide range of audiences.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The USA National Phenology Network (USA-NPN), a program based at the University of Arizona, supports basic science, natural resource decision-making, and education and outreach not only for the nation but also with special focus in the American West and in Arizona. With support from NIFA, we were able to continue to offer the data, resources, infrastructure, and information the USA-NPN has become known for and relied upon by scientists, natural resource managers, educators, and the news media. One activity of the USA-NPN is to offer a growing suite of Pheno Forecasts – maps that indicate the timing of seasonal events of management concern. For example, the USA-NPN delivers daily maps indicating where green-up in buffelgrass may occur in next 1-2 weeks (light green), and where it is likely to occur in the next 1-2 weeks (dark green; see figure below) based on gridded daily precipitation totals (<https://usanpn.org/data/forecasts/Bufelgrass>). Natural resource managers from around southern Arizona consult these forecast maps to guide where to send crews to maximize treatment efficacy. Over the duration of this funding support, the USA-NPN operationalized a new Pheno Forecast – a real-time and short-term forecast indicating the development of winter wheat (https://www.usanpn.org/data/forecasts/winter_wheat), which is frost-sensitive once it shifts from the overwintering vegetative phase to the spring reproductive phase.

Another primary activity of the Network is to operate Nature's Notebook, a phenology observation program used extensively by professional and citizen scientists nationally. The observational phenology dataset facilitated and maintained by the USANPN is by far the largest, most comprehensive observational phenology dataset in the U.S. and the only phenology data resource collected in the U.S. with rigor and quality control sufficient to be used in fundamental and applied research. The phenology data amassed via Nature's Notebook are widely used in management decisions. The Nature's Notebook program is also used by tens of thousands of individual observers and members of federal, state, NGO, and private sector organizations as well as K-12 and higher-ed institutions. With the support from this grant, we were able to continue to offer these resources and opportunities for professional and citizen scientists and students nationwide. In both 2020 and 2021, over 3,500 individuals and over 170 groups contributed phenology observations to Nature's Notebook, despite significant challenges presented by COVID.

Briefly describe how your target audience benefited from your project's activities.

Scientists, natural resource managers, and educators across the country used phenology data contributed to Nature's Notebook. In 2020, 18 peer-reviewed manuscripts using these data were published, and in 2021, another 17 manuscripts were published. Natural resource managers referenced the Pheno Forecasts to support decisions and planning. Educators used the Nature's Notebook interface and resources to teach K-12 and college and university classes about phenology and citizen science.

Briefly describe how the broader public benefited from your project's activities.

One of the most tangible and quantifiable metrics of public benefit is the number of media mentions of USA-NPN maps, products, and information. In 2020, the USA-NPN experienced nearly 150 media mentions, and in 2021, this number was approximately 60. Outlets included The New York Times, The Washington Post, The Today Show, The Weather Channel, and many more.

Describe and explain any major changes or problems encountered in approach. Additionally, note opportunities for training and professional development provided, how results have been disseminated to communities of interest, and any new details regarding what the project or program plans to do during the next reporting period to accomplish the goals.

The funding provided through this grant provided critical support for the USA-NPN as the major source of funding was suddenly and drastically reduced in early 2020. In late 2020, several USA-NPN team members were let go, and the remaining team members reconsidered priorities and work allocation. With the support provided by NIFA, we have been able to continue to offer the resources, support, data, and information the program is known for, and have even released a small number of new data products during this time. We have also been able to leverage this support and secure additional grants from the USDA, NSF, and USGS. We are placing substantial effort into restoring sustainable funding for the program from USGS through appropriations.

Type

Projects / Programs

Projects / Programs without a Critical Issue

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Not Provided