

# Utah State University Combined Research and Extension Plan of Work 2021-2025

**Status: Final**

**Date: 07/14/2020**

## **I. Plan Overview**

### **1. Executive Summary**

Brief Summary of "Plan of Work"

This plan of work addresses seven Critical Issues that are consistent with NIFAs goals: (1) Global Food Security and Hunger, (2) Climate Change and Management of Natural Resources, (3) Nutrition and Health, (4) Food Safety, (5) Healthy, Financially Secure Families, (6) Youth Development, and (7) Community Resilience.

#### Global Food Security and Hunger

The objective of this goal is to enhance global food security through productive and sustainable agricultural systems. This is not meant as an abandonment of past agricultural practices or agricultural systems. It requires an expanded view of agriculture, not an abandonment of agriculture. We can make real progress in improving the standard of living, not only in the U.S., but throughout the world. In order to feed growing populations, we must develop more stress-resistant crops and ensure an improvement in overall productivity of livestock. Scientific discoveries that result in heat, drought, and saline-resistant plants will allow farmers to remain competitive in world markets, while contributing to farm production throughout the world. Future investigations will range from traditional crop and livestock breeding, but will also emphasize genomics. Crops will be produced which rely less on man-made inputs like fertilizer and fuels, and more on gene manipulation. However, it will require more than laboratory work as these improved plants must be field-tested, both at home and abroad. More focus will need to be given to the "science" of agriculture. Animals must be made more efficient in the use of existing or even altered forage resources.

#### Climate Change and Management of Natural Resources

Agriculture is climate dependent. Consequently, any changes in the environment such as climate change will require that plants and animals adapt to or mitigate climate change. Agriculture can be at the forefront in adapting to new climate realities, as well as mitigating many of the influences of climate change. The concept of climate change is not new to Utah producers. Utahans have adjusted to changes in water and temperature for many years. Yet, there is more that can be done to enhance the productive environment of both plants and animals. Animals can become more efficient in the consumption of forages through appropriate breeding practices and tailoring livestock to meet forage conditions. While there is great vigor in many breeds, some are clearly not appropriate for the sparsely vegetative state of much of Utah's land. Efficiencies can be improved through genetic modifications as well. Plants can be made more resistant to drought and salinity through traditional breeding practices, and through the application of genomics. Water will become an even more critical part of agricultural production processes as it becomes less available and/or the quality becomes less suitable for agriculture. The idea of water dependency under climate change cannot be over emphasized as populations increase and water shifts from agricultural to municipal and industrial uses. Public/private land interface is another area requiring extensive research and outreach. Sixty percent of the total land available in the West is public land, owned by either the state or the federal government. This presents unique challenges to the West that most of the rest of the country cannot begin to understand.

#### Nutrition and Health

It seems strange to speak of nutrition in a country that has such a remarkable food system, but nutrition is a significant problem even in this country--but it is a problem of both scarcity and plenty. Much of the most vulnerable populations, such as young children and aging adults, are subject to food scarcity. Our common goal should be to allow our children to live healthy and productive lives. Hence, adequate nutrition becomes a problem for those both affluent and those in poverty within the U.S. and others scattered throughout the world that do not have enough food to eat to avoid disease and malnutrition. Because the public university system has been so successful in moving agriculture and food technologies forward, they should also be the means to make the food selections more nutritious. In addition to changing the nutritional quality of food, educational efforts to teach people the consequences of obesity must become more effective.

## Food Safety

Food safety is a necessary area of emphasis as food and fiber pathogens increasingly cost the U.S. economy significant lost time and increased health expenditures. New diagnostic tools need to be developed to rapidly test food products for pathogens. But even more basic is the need to provide a safe system through which food can be transferred. Some of that will involve better identification of food and fiber flows within the U.S. and throughout the world. Traceability will become increasingly important but new, less costly methods of food chain identification must be developed. Pathogens can enter the food supply at any point during the production, harvest, processing, and transporting process. It is critical that the U.S. consumer not have to question if their food is safe. Great strides have been made in protecting the food system, but additional research and outreach are required. The American people need to have confidence in the safety of their food supply, which sometimes is a difficult task given the extensive processing that occurs. It must always be remembered that America has the safest food supply the world. Food safety in the home is also important and is included in this critical issue. Areas of concern include proper preparation, storage, and preservation of food, including proper procedures for canning foods.

## Healthy, Financially Secure Families

Utah is in the top 5 of the U.S. states with bankruptcy and much more research and education need to be done in order to free the state's consumers from this trap. Because of Utah's typically larger family size, the amount of income available for basic family needs slips below the mean for the rest of the United States. Utah families already face high debt loads leading to bankruptcy, low savings, and the lack of liquid assets. Hence, a priority of this planned program is to enhance individual and family resource management. Other aspects of family health that will be addressed include healthy marital and family relationships, mental health and wellbeing, domestic violence, and programs that support healthy eating habits.

## Youth Development

Youth issues are paramount in a state with higher than average birth rates. As the number of youth grows, more research on education is needed in identifying factors that influence growth and maturation. A significant priority of this critical issue is to discover improved methods for encouraging positive youth development.

## Community Resilience

The existing conflicts between private and public land owners and urban-rural pressures are likely to be exacerbated over the next 5 years as alternative uses of public and private lands increase and urban encroachment continues to extend into rural areas of the state and region, resulting in a decline of available open-space. The economic viability of

many rural areas is also in jeopardy. Economic development through business retention and expansion activities need to be implemented in struggling communities. In addition, community resilience depends on sound community planning, and investment in critical infrastructure for education, childcare, youth development, recreation, health care, and family support services.

Summary

This plan of work (POW) has been put forth in accord with the new NIFA format for the POW introduced for the FY2020. The Utah Agricultural Experiment Station and Utah Cooperative Extension Service have organized our POW based on seven newly defined Critical Issues. Moving forward, more emphasis will be placed on interdisciplinary work in order that a more holistic approach is taken in solving the many problems facing U.S. and world consumers. It is anticipated that both Capacity and Competative research projects, except for the most basic, will have an outreach component to fully take advantage of the special training system already in place within the U.S. land-grant research and outreach system.

**2. FTE Estimates**

Year	1862 Extension	1862 Research
2021	90.0	53.9
2022	90.0	53.9
2023	90.0	53.9
2024	90.0	53.9
2025	90.0	53.9

**II. Merit / Peer Review Process**

Scientific Peer Review Process - Agricultural Experiment Station: The scientific peer-review process within the agricultural experiment station involves three steps. First, prior to submission to the experiment station, the PI's department head reviews and signs off on the proposal. Once the proposal reaches the experiment station, two scientific peer reviews are obtained from subject matter experts, either from other on-campus faculty (if the expertise exists) or off-campus faculty (if on-campus expertise does not exist). The reviews are returned to the experiment station and the PI's are subsequently asked to respond to issues raised by the reviewers. When responding to the reviews, the PI needs to provide a written response to the reviews and modify her/his proposal to address the issues raised by the "outside" reviewers before resubmitting it to the experiment station for funding consideration. The final step is that the Associate Director of the Agricultural Experiment Station reviews the proposal prior to its submission to NIFA.

Merit Review Process - Extension Plan: The Cooperative Extension merit review process will include a peer-review of programs targeted towards each critical issue, an annual client satisfaction survey, and ongoing formative program evaluation activities at the state and county level. The peer-review process will involve a critical assessment of programs related to each of the seven critical issues identified in the FY 2021 institutional profile. State specialists at peer institutions will participate in the peer-review process. Periodic client satisfaction surveys will seek input from users and stakeholders of Extension services through a mixed-methods research design. The research will provide an indication of the perceived quality, relevance, and broad impact of Extension programming throughout Utah. Finally, state specialists and county directors will contribute to an ongoing formative evaluation of Extension programming for continuous program improvement. This includes an internal qualitative analysis of the strengths, weaknesses, opportunities, and threats to county-level programming. Overall, the merit review process will ensure a high quality of relevant Extension programming in Utah.

### **III. Stakeholder Input**

#### **1. Actions to Seek**

Actions taken to seek stakeholder input that encourages participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public

Brief explanation

Input from stakeholders will be sought by county extension faculty who will hold sessions with stakeholders throughout the year to obtain input into the plan and propose revisions. In addition, stakeholder groups will be utilized to provide further clarification to the new plan and the seven Critical Issues that the Agricultural Experiment Station and Extension are addressing.

#### **2. Methods to Identify**

Methods used to identify individuals and groups

- Advisory Committees
- Internal Focus Groups
- Open Listening Sessions
- Surveys

Brief explanation

Extension county offices and the Agriculture Experiment Station will share the current plan of work with advisory committees, focus groups, and individual constituents, to ascertain its relevance to these stakeholder groups. Modifications to the plan of work suggested by these groups will then be considered in subsequent plan revisions.

#### **3. Methods to Collect**

Methods used for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder audiences
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional individuals
- Survey specifically targeting non-traditional audiences
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation

A variety of methods will be used to collect stakeholder input as noted above, though not all would necessarily be used in the same year. Specific meetings will be held with appropriate stakeholder groups to solicit their input.

#### **4. How Considered**

How the input will be considered

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

Brief explanation

Input from the various stakeholders will be used in helping set research and extension agendas to address the seven Critical Issues identified in our FY2021 Plan of Work. Stakeholders from whom input will be sought include: research scientists, community leaders, community citizens, politicians, underserved communities, and extension faculty and staff. Therefore, the areas targeted in this Plan of Work will reflect the views of a broad set of stakeholders, including the federal government, and will provide a valuable guide to the programs selected for emphasis.

#### **IV. Critical Issues**

##### **1 Global Food Security and Hunger**

###### **Description:**

The first Critical Issue is to enhance global food security through sustainable agricultural practices. To feed growing populations, we must develop stress-resistant crops and ensure the overall productivity of livestock. Discoveries that result in heat, drought, and saline-resistant plants will allow farmers to remain competitive in world markets, while contributing to farm production throughout the world. Future investigations will range from traditional crop and livestock breeding to newly mastered genomics. Crops will be produced which rely less on man-made inputs like fertilizer and fuels, and more on gene manipulation. These improved plants and must be field-tested. Animals must be made more efficient in the use of forage resources.

**Term:** Long

###### **Science Emphasis Areas**

Sustainable Agricultural Production Systems

##### **2 Climate Change and Management of Natural Resources**

###### **Description:**

The Western U.S. contains states with vast tracts of public land surrounding smaller areas that are privately owned, mostly adjacent to water. The natural resource base of any economy is critically important to the economic and aesthetic environments for that area. Changes in the natural resource base brings variation in the underlying economic and social structure. Critical issues affecting natural resource characteristics are found in soils, water, range, forest, animals, and air resources. The proper and efficient management of these resources is a primary concern, particularly for environments as varied and unique as in the West. This Critical Issue involves improving decision-making relative to environmental stewardship in an economic, social, and biological sense.

**Term:** Long

###### **Science Emphasis Areas**

Agroclimate Science  
Bioeconomy, Bioenergy, and Bioproducts

### 3 Nutrition and Health

**Description:**

There has been a crisis of nutrition in the U.S. even though there have also been large food surpluses. There is a need to provide better nutrition information on various types of food to enable consumers to make wise choices. As the relationships among diet, health, and disease prevention have become clearer, nutrition and the promotion of healthy eating behaviors and lifestyles have received increased attention. Many teenage mothers are found in the low-income brackets and they can benefit from participating in various nutrition programs as well as those eligible for Food Stamp Assistance. The priorities for this Critical Issue are to expand nutritional research and education, and to enhance nutrition behavior.

**Term:** Long

**Science Emphasis Areas**

Human Nutrition

### 4 Food Safety

**Description:**

The food production complex is extraordinarily large within the US, offering the largest variety of food of any nation on earth at the lowest relative cost. With the large variety of food products, food safety is a critical issue that must be dealt with by producers, processors, distribution systems, and the final consumer. Food borne illness is a major cause of death, claiming the lives of our most vulnerable populations: the elderly, young, pregnant women, people with impaired immune function and the chronically ill. It also causes needless lost time from productive roles in the workplace. Improper food handling and preparation of food in food service establishments and in the home contribute to food borne illnesses.

**Term:** Long

**Science Emphasis Areas**

Food Safety

### 5 Healthy, Financially Secure Families

**Description:**

Utah is in the top 5 of the U.S. states with bankruptcy and much more research and education need to be done in order to free the state's consumers from this trap. Because of Utah's typically larger family size, the amount of income available for basic family needs slips below the mean for the rest of the United States. Utah families already face high debt loads leading to bankruptcy, low savings, and the lack of liquid assets. Hence, a priority for this Critical Issue is to enhance individual and family resource management. Other aspects of family health that will be addressed include healthy marital and family relationships, mental health and wellbeing, domestic violence, and programs that support healthy eating habits.

**Term:** Long

**Science Emphasis Areas**

Family & Consumer Sciences

### 6 Youth Development

**Description:**

Youth issues are paramount in a state with higher than average birth rates. As the number of youth grows, more research on education is needed in identifying factors that influence growth and maturation. A significant priority for this Critical Issue is to discover added methods for encouraging positive youth development.

**Term:** Long

**Science Emphasis Areas**

Education and Multicultural Alliances

Youth Development

**7 Community Resilience****Description:**

The existing conflicts between private and public land owners and urban-rural pressures are likely to be exacerbated over the next 5 years as alternative uses of public and private lands increase and urban encroachment continues to extend into rural areas of the state and region, resulting in a decline of available open-space. The economic viability of many rural areas is also in jeopardy. Economic development through business retention and expansion activities need to be implemented in struggling communities.

**Term:** Long

**Science Emphasis Areas**

Education and Multicultural Alliances

Family & Consumer Sciences