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## 2007 Utah State University Combined Research and Extension Plan of Work

### Brief Summary about Plan of work

This plan of work encompasses nine major program areas: (1) Land and Sustainable Communities, (2) Sustainable Plant Communities, (3) Sustained Livestock Production, (4) Plant, Animal, and Microbial Genomics, (5) Nutrition, Production, and Safety of Food Products, (6) Water and Soil Conservation and Uses, (7) Natural Resource Systems and the Environment, (8) Production, Marketing, Trade, and Development Economics, and (9) Individuals, Families, and Communities. Each is briefly introduced below.

#### Land and Sustainable Communities

The Western U.S. contains many of the fastest growing states in the nation. These states often contain vast tracts of public land that comprise an average of 60% of the available land base, surrounding smaller areas that are privately owned, mostly adjacent to water. Traditionally, these states have relied on livestock or extractive industries to fuel local economies, but this situation is changing rapidly as urban areas expand into the relatively small privately held acreage, most of which involves agriculture in some form. In addition, there are many resulting conflicts between public and private land and their uses. Finally, many rural communities remain in peril as populations shift to urban areas and local industries become less profitable. The results of a state survey and forum listening sessions showed that eighty-nine percent of respondents felt USU should have strong community development programs, anchored in research, education, and teaching to help Utah's communities chart their futures. Further, results of the listening sessions showed that ninety-two percent of respondents believed that Utah State University should be involved in the development of programs and research which impact Utah communities' land use decisions at local, state, and federal levels. Respondents felt that specific program strategies to improve coordination and cooperation between federal, state, and local jurisdictions to achieve land management and resource conservation strategies were exceptionally important/reasonably important. Regional focus groups reported concern about several issues to be addressed by this program. They mentioned loss of agricultural lands and open space, concern with preservation of private development rights, and the need to revitalize rural Utah by building communities.

#### Sustainable Plant Communities

The overall goal of this research is to develop plant materials that are ideally suited to the Intermountain Region's climate. One of the basic parts of this planned program is the development of enhanced plant genetic material, primarily through traditional crop breeding programs. We are also improving plant biological efficiency and their ability to deal with abiotic stress. In addition actual plant *management* systems need to be improved to gain the most from the other plant research that is done. Work is underway to control plant pests, including weeds, insects, pathogens, etc., especially in the area of augmented integrated pest management (IPM) systems. The state survey and forum listening sessions showed that an overwhelming 99 percent of respondents felt that agriculture production and marketing were exceptionally important or reasonably important to have in the new plan of work. Additionally, 87 percent felt that yard and garden issues were exceptionally or reasonably important issues and 76 percent felt that enhancement of crops and livestock on small acreages were important to the Extension plan of work.

#### Sustained Livestock Production

Livestock and livestock products comprise over 70% of the agricultural cash receipts in Utah. While the main focus of this planned program is animal nutrition and animal management systems, other diverse knowledge areas are also associated with this planned program area. With such a large proportion of agricultural receipts coming from livestock, it is critical that research and educational efforts be directed toward solving some of the major problems associated with livestock: profit, markets, rates of gain, health, and environmental concerns. The results of a state survey and forum listening sessions showed that an overwhelming 99 percent of respondents felt that agriculture production and marketing were exceptionally important or reasonably important to have in the USU's plan of work.

#### Plant, Animal, and Microbial Genomics

Work in genetics, particularly through biotechnology, is the next best technology available in improving plant, animal, and

microbial efficiencies. Efforts to enhance plant, animal, and microbial efficiencies are central to the continued economic and physical viability of agriculture and food and fiber production. With prices essentially stable and costs rising, the primary hope for existing agricultural producers is that there will be technologies developed that will enhance productivity. With productivity gains, producers increase the likelihood that they can remain in business.

#### Production and Safety of Food Products

The food production complex is extraordinarily large within the US. As a part of this complex, U.S. citizens enjoy the largest variety of food of any nation on earth at the lowest relative cost. Consumers are driven to search out and try new and improved food products. Two areas of this food system that are of special interest to Utah are milk and meats, though other products are also researched. This vast choice of foods brings with it an issue of food safety throughout the system—production, processing, and consumption. With the large variety of food products, food safety is an issue that must be dealt with by producers, processors, distribution systems, and the final consumer. The results of a state survey and forum listening sessions showed that eighty-nine percent of respondents believed that Utah State University should be involved in the development of programs and research which reduce the incidence of food borne illnesses and contaminants through science-based knowledge and education. Respondents felt that specific program strategies addressing food safety (91%), food quality (87%), preservation and storage in the home (87%), and commercial food handler's safety (81%) were exceptionally and reasonably important to a plan of work.

#### Water and Soil Conservation and Uses

Soil and water conditions greatly impact the earth's ability to produce plant materials, which in turn leads to issues related to animal feeding. Animal or livestock feeding is the major use made of arable land within Utah. Hence, issues related to plants and animals are truly based in the nature and composition of soil and water. Furthermore, water is extremely scarce in the semi arid west. Most of Utah receives less than 16" of moisture per year. Water must be saved from winter periods of snowfall, held in reservoirs as it melts, then distributed to arable land through a vast network of ditches and canals. Wise water use is essential and is affected by the type of soil across which the water must flow. Work is needed to better understand plant biological efficiency and abiotic stresses affecting plants. This, in turns, impact plant management systems. All water and soil uses are tied together in water and soil markets, only the latter of which is relatively well-developed. The results of a state survey and forum listening sessions showed that an overwhelming 99 percent of respondents felt that addressing water supply, quality, and demand in Utah were exceptionally important or reasonably important to include in USU's plan of work. Additionally, 98 percent of respondents felt conserving and enhancing the efficient use of water in agricultural, 97 percent in residential settings, and 95 percent in commercial/business settings were important to the plan of work. Soil identification and conservation were rated as exceptionally important or reasonably important by 88 percent of survey respondents. Ninety-three percent felt that helping homeowners, farmers, ranchers, and government agencies manage natural resources were appropriate areas for extension and research.

#### Natural Resource Systems and the Environment

The natural resource base of any economy, be that local, regional, or national, is critically important to the economic and aesthetic environment for that area. The resource base of a region defines much of what can be done in a region. Changes to that natural system bring about changes in the underlying economic and social structure, some positive and some negative. Given the values associated with natural resources and the environment, it is critical that the elements of each be better understood. Although there are numerous aspects of a natural resource systems, for purposes of this program, the natural resources considered in this plan or work include those characteristics found in range, forest, animals, and air resources. The proper and efficient management of these resources become a primary concern, particularly for environments as varied and special as in the West. This planned program involves improving decision-making relative to environmental factors in an economic, social, and biological sense. The results of a state survey and forum listening sessions showed that 93 percent of respondents felt that helping homeowners, farmers, ranchers, and government agencies manage Utah terrain, including wildlife, are areas for programs and research. Ninety percent felt that management and sustainability of urban/rural forests are exceptionally important or reasonably important to a plan of work. Eighty-nine percent felt that enhancing the quality of range resources and 78 percent felt air resource conservation and management are exceptionally or reasonably important for extension and research programming.

#### Production, Marketing, Trade, and Development Economics

Economic analysis enters the decision-making process almost constantly as consumers and producers act. Economic analyses are critical to the adoption of various production and conservation practices. A primary area of focus will be that of market economics and marketing and distribution practices. International trade and its impact on local, regional, and national economies will also be examined and identified. Economic models that are based in theory must be developed and tested. Alternative quantitative methods are often used to measure economic impacts and are of critical importance to understanding economic influences. Jobs and the economy were the second highest priority issue for Utah citizens in a 2004 Utah Priorities Poll. The results of the state survey and forum listening sessions showed that ninety-four percent of respondents believed that creation of jobs, Utah's wage rates, and programs and incentives to attract new businesses were exceptionally and reasonably important to a plan of work. Utah State University should be involved in the development of programs and research that provide manufacturing assistance to Utah businesses (87%) and promote the economic prosperity of Utah through business competitiveness, entrepreneurship, and economic diversification (82%).

Individuals, Families, and Communities

This planned program is designed to answer many of the questions surrounding issues relating to individual, family, and community well-being. Eighty-nine percent of respondents believed that Utah State University should be involved in the development of programs and research that promote healthier food choices through research and education. Respondents felt that specific program strategies centered on health issues (93%) and nutrition (89%) were exceptionally and reasonably important to the plan of work. Ninety-one percent felt that programs and research which promote human development and well-being were important. Ninety-four percent of respondents felt programs and research that promote sound financial management and finances by strengthening Utah families in financial security were exceptionally important/reasonably important. Focus groups of recent bankruptcies by Dan Jones & Associates revealed that many Utahns have poor financial management practices and skills. These include credit card abuse and mismanagement, a lack of savings, and poor financial skills including over-consumption. Through the Utah 4-H program youth become engaged in youth development activities offered by the county extension offices and the state 4-H office.

Summary

These program areas respond to these issues through the research and expertise of USU's Experiment Station faculty and Extension specialists, agents, and Extension assistants and volunteers. All of these professionals educate their respective target audiences. For experiment station faculty, their audiences are geared primarily towards extension specialists and other scientists while the specialists' audiences include peers, county agents, federal and state organizations, producer groups, and the general public. County agents, assistants, and volunteers work cooperatively with federal, state, and local governments, citizen groups, and the public to address Utah issues in their respective areas.

Estimated amount of professional FTEs/SYs to be budgeted for this plan.

Year:	Extension		Research	
	1862	1890	1862	1890
2007	158.0	0.0	37.5	0.0
2008	158.0	0.0	37.5	0.0
2009	158.0	0.0	37.5	0.0
2010	158.0	0.0	37.5	0.0
2011	158.0	0.0	37.5	0.0

**Merit Review Process**

The merit review process that will be employed during the 5-Year Plan of Work cycle.

- External University Panel
- Combined Internal and External University Panel
- Expert Peer Review

**Brief explanation**

**Merit Review Process - Extension Plan:** The cooperative extension service merit review process will involve a review by the University of Wyoming, University of Arizona, and the University of New Mexico extension services. These institutions will review the program components suggested in each program area utilizing extension faculty qualified as specialists with significant program experience in the area being reviewed. In turn, Utah State University Cooperative Extension Service will review the work from these three institutions.

**Scientific Peer Review Process - Agricultural Experiment Station:** The scientific peer-review process within the agricultural experiment station involves two steps. The first step includes a review by two scientists requested by the principal investigator (PI). These two scientists provide written comments regarding the proposal and return them to the PI for evaluation and response. Prior to submission to the experiment station, the PI's department head also reviews and signs off on the proposal. Once the proposal reaches the station, two additional 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 these reviewers. The PI must then modify his/her proposal to address the issues raised by the "outside" reviewers before resubmitting it to the experiment station for funding consideration. The practice of sending reviews off-campus to qualified subject matter experts has increased over the past two years.

**Evaluation of Multis & Joint Activities**

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders? Identified issue areas of importance to research, program development and delivery will be reviewed by collaborators. Collaborators include federal and state agencies, private and non-profit groups, geographically contiguous state extension and experiment stations, and university academic departments who have research and program interests identified by stakeholders. Research and program leaders will then establish