

2010 Utah State University Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The Utah Agricultural Experiment Station (UAES) and Utah Cooperative Extension Service (UCES) work in five major program areas: (1) Global Food Security and Hunger, (2) Climate Change and Natural Resource Use (3) Sustainable Energy (4) Childhood obesity, nutrition, and community, and (5) Food Safety. A 2010 progress report on each is briefly described below.

GLOBAL FOOD SECURITY AND HUNGER

USU is involved in wheat and barley research. The primary outcomes of the research are improved spring barley and winter barley cultivars as well as yield trial data to aid in stakeholder decision making. These released cultivars such as Curlew this year result in a change in the planting decisions for these stakeholders. For wheat, the release candidate UT9743-42 reported a three year average yield of 123.7 bu/ac which was 8.7 bu/ac higher than the 3-year average of Garland, the current standard variety. For spring barley, the highest 3-year average yielding line in the county yield nurseries was UT6R2120-35 at 135.5 bu/acre. The highest three year average yield for a released cultivar was 122.7 bu/acre for Millennium. This is 12.8 bu/ac less than UT6R2120-35. The three year average yield for UTWB9401-19 was 156.8 bu/ac compared to 149.9 bu/ac for the highest yielding released cultivar, Strider. If released, it will be the first winter barley variety released in Utah.

Northern Utah raspberry growers applied one or two insecticide applications to reduce raspberry horntail adult population densities when adults were first detected in the region based on field sampling. Accurate timing of insect control reduced horntail infestation levels by an average of 50% on approx. 76 acres of raspberry. The average increase in profitability from horntail control was approx. \$300 per acre for a total increase in profits of \$22,800.

USU assists residents with home horticulture and gardening through a number of different activities and programs including placing horticulture related news articles in county wide newspapers; yard and garden classes on pruning fruit trees, lawn care, drip irrigation, vegetable production, and hanging baskets. A drip irrigation fact sheet published in 2009 is being used in 50% of the counties in Utah and in 15 states. USU offers a plant pest diagnostic clinic throughout the growing season where pictures are sent to either Thanksgiving Point or Utah State University in Logan to help diagnosis plant problems. From an informal survey from the participants, USU found that by following the recommendations given to them during the clinic they were able to save over \$300 on their home landscape.

USU Extension has water-wise native plant demonstration gardens with interpretive signs for each garden that provide links on the signs to the USU Extension website for further information on native plants and water-wise landscaping, and to direct website visitors to the location of the gardens. These, in turn, link to USU Extension fact sheets and bulletins that have and will be written on these topics.

USU Extension presentations made to commercial fruit producers have resulted in several of the large-scale producers participating with the NRCS EQIP program. At least three growers have invested in capacitance equipment for measuring soil moisture and are integrating this equipment into orchard irrigation management practices. One orchard manager reported that by using this technology and his increased knowledge of orchard irrigation, he had delayed the first spring irrigation on one of his farms by 12 days. This resulted in a savings of 144 acre-feet of water and approximately \$2,400 in pumping costs on that one farm alone. For orchard growers, deficit irrigation results show potential benefits for water conservation and improved fruit quality; however, there is significant risk for undesirable side effects

including tree damage and death. Orchard irrigation monitoring and management practices have now been adopted by three of the five largest fruit farms in Utah (ca. 1,200 acres). They have reported saving tens of thousands of dollars in pumping costs in the first season of using this technology.

USU Extension meets with, teaches, and assists farmers, ranchers and private landowners about protected forage quality and yields, understanding grasshopper biology and control options, and understanding how to obtain 90% cost-share money from USDA and local government. Through USU Extension's grasshopper control program with the Utah Department of Agriculture and Food 6 farmers in Beaver County get reimbursed for spraying over 1500 acres of crop and pasture ground. Most of the farmers got paid back at a rate of \$14.00/acre so this was a savings to them of \$21,000. The ground squirrel control program was very successful. Farmers can get up to 75% control if they use the prebait-bait program. In the areas where farmers are using this program the number of squirrels has been greatly reduced. A follow up survey showed that farmers saved over \$100,000 by using USU Extension's ground squirrel control program.

USU Extension holds workshops on Small Acreage management around the state. These workshops were based on data generated by UAES scientists. The development of the SmAc website helps small acreage owners via these resources and the entire effort increases the visibility of the local USU Extension Offices and the resources there to this new group of Extension users. Previous surveys conducted suggest that small acreage owners experience a \$25 per acre benefit from implementing Extension recommendations.

USU Extension and Agriculture Experiment Station conduct integrated orchard research including use of validated trap thresholds that enhances detection of codling moth in mating disrupted orchards, decreasing errors in application of supplemental insecticide controls (both over- and under-treatment), and increased use of mating disruption by Utah's apple producers. On-farm demonstrations using reduced-toxicity insecticides as alternatives to organophosphate (OP) insecticides for cherry fruit fly control has increased the use of low toxicity insecticides and helped cherry growers move away from reliance on OPs as they are phased out of registration by Environmental Protection Agency. USU showed there are clear differences among four commonly used mating disruption (MD) dispensers that release sufficient pheromone after 140 days of field aging. Based on these results, we advise growers to carefully monitor codling moth activity in all MD-treated orchards. These results help growers select the most effective MD dispenser for use in their orchards.

During the 2010 season, Utah had a major reduction of adult beetles caught in USU traps that were set up in the Orem Beetle area. Over 1900 traps were set out in a much smaller area than the 2009 program. The total number of beetles caught in the 2010 season was only 2, which was approximately a 99% reduction of beetles trapped during the previous season. Master Gardener and other Extension people continue to assist with this eradication program. All of the participants including Utah Food and Ag., Utah State University and Utah County Extension were all greatly elated at the tremendous success of the spray program this year.

Utah State University Extension participates in jail gardens in prison facilities throughout Utah. One Jail Garden produced over 52 tons of produce. This was from approximately 21 different vegetable and fruit varieties. There were over 7,200 man hours donated by the jail inmates. During the 2010 season, there were 22 female inmates that assisted with the growing, harvest, and care of the jail garden. They had a total of 488 hours of service. The jail officers continue to use this program as a training site for the inmates as they prepare to leave the jail facility.

Infestations of onion thrips is the most common cause for insecticide use in dry bulb onion production in the western U.S. As a result of UCES and UAES, Utah onion growers have switched their primary onion thrips pest management strategy from sole reliance on repetitious insecticide applications to crop management (especially nitrogen and irrigation management), biological control, and rotations of reduced-risk insecticides. These changes impact approx. 2,000 acres of dry bulb onion production in Utah for an annual savings of approx. \$180,000 and improved consistency in bulb quality and size. Reduced insecticide use contributes to environmental impacts by reducing non-target effects on beneficial insects, water and soil quality, and ecosystem health and reduces human exposure to pesticides from farm applicators to onion consumers. Two growers report that they now are growing their onions (260 acres;

20% of Utah Acreage) with reduced nitrogen applications while still maintaining good yields. This acreage is not being sprayed with insecticides and growers report that thrips numbers are low, and IYSV is not a problem. With these management changes, growers report production costs reduced by about \$1000/acre for a savings of \$260,000.

More than 35 minor food crops and a large variety of nursery and landscape crops are grown in Utah. The total value of Utah minor crops is \$98 million. This program has helped in securing clearances for registration of certain pesticide uses on these Utah crops: alfalfa, apple, apricot, asparagus, bean (dry), broccoli, brussel sprouts, cabbage, cane berry, canola, cantaloupe, carrot, cauliflower, cherry (sweet), cherry (tart), clover, field corn, honey and beeswax, honeydew melons, lettuce, onion (dry), pasture grass, peach, pear, plum, potato, pumpkin, range grass, raspberry, safflower, snap bean, spinach, squash (winter/summer), sweet corn, tomato and watermelon. Potential economic losses of \$11,900,000 are estimated without this program. It is important to secure minor use registrations for agricultural producers for legal reasons and also to increase grower productivity and profitability. These additional registrations help maintain a high quality and varied supply of food, feed, and fiber and help to manage cases of pest resistance.

The Utah IPM Program and Utah Plant Pest Diagnostic Lab (UPPDL) work in concert to achieve common goals. Recently, the two groups created a visual identity, called "UTAH PESTS." The IPM program and UPPDL Web sites are both housed under the UTAH PESTS umbrella. The IPM Program assists the UPPDL through site visits and field diagnostics, field scouting and notification of unusual pest sightings, contribution to and facilitation of workshop programs including First Detector training, coordination/ preparation of the UTAH PESTS quarterly newsletter, and coordination/management of a county agent database of diagnoses from regionally-held plant clinics. Effective training has not only led to diagnosis of problems, but has resulted in recommendations that fit IPM goals and provide the most sustainable control options.

Findings from the EBIPM (Ecologically-Based Invasive Plant Management) Research/demonstration site in Park Valley, Utah, indicate that the presence/abundance of cheatgrass (*Bromus tectorum*) in heterogeneous soils is highly correlated to the presence of litter on the soil surface. Other soil properties (texture, pH, macronutrients) did not exert as strong an influence on presence/absence of cheatgrass. Of the manipulation treatments applied in 2009 (prescribed fire and imazapic herbicide application, alone and in combination) and evaluated in 2010, the fire/herbicide treatment had the greatest impact in reducing cheatgrass cover (17% compared to 40% for control). The fire/herbicide treatment also had the greatest impact in promoting the establishment of seeded species (17 plants/m² compared to 6 plants/m² for control). The prescribed fire removed cheatgrass litter (killing cheatgrass seeds suspended in litter), and promoted herbicide penetration into the upper soil layer to kill germinating cheatgrass seeds. Fire alone did not kill cheatgrass seeds protected in the upper soil layer; and when applied alone, a portion of the herbicide was tied up in litter and did not reach cheatgrass seeds in the upper soil layer. Thus, the combination of the two treatments overcomes these deficiencies and has a greater suppressive effect on cheatgrass, promoting greater establishment of seeded species. The costs for the treatments were: prescribed burning at \$33.95/ha, imazapic herbicide treatment at \$61.08/ha, and drill seeding the grass/forb mix at \$79.12/ha. One rancher in the Park Valley area has incorporated a similar strategy in a large-scale cheatgrass restoration effort on his property this year. While these costs may seem prohibitive, the cost of controlling cheatgrass is very cost effective when compared to the high cost of fighting wildfires and the other negative results associated with the subsequent invasion of cheatgrass.

Thousands of applicators received education and training that helped them to become certified or recertified as licensed applicators with the UDAF thus staying in regulatory compliance. Hundreds of applicators wrote on evaluations that they would make positive changes in their use of pesticides. Environmental and human exposures to pesticides and their residues were reduced. Efforts improved environmental and public health.

Accurate and timely pest activity information and new management options provide green industry professionals, home gardeners, and tree fruit growers with the knowledge they need to treat pest problems with a minimal use of softer materials. The advisory program has had a positive impact on pesticide use in Utah, resulting in fewer unnecessary pesticide sprays, and conversion to softer materials. As people learn

more about IPM, their perceived impediments to adopting IPM, such as a risk of damage and higher costs, are set aside, and what follows is confidence in implementing IPM techniques. In meeting the National IPM Roadmap goals, producing healthy plants without environmental degradation is a key priority. Advisory subscribers often send us feedback, and one of the most common comments is that their produce has never been healthier. Savings to growers and homeowners are due to reduced sprays, better spray timing, and knowledge of appropriate products.

Tall fescue is the primary grass growing on more than 14 million ha of pasture- and hay-land in the United States. Most tall fescue is endophyte-infected, and the negative impact of tall fescue alkaloids on beef production places the total livestock-related losses at \$500 million to \$1 billion a year. However, the alkaloids in tall fescue, so problematic for ruminants, make the plant highly resistant to drought and other stresses. Improved seedling performance and survival, as well as insect and nematode resistance, drought resistance, improved nitrogen assimilation, higher seed set, and overall increased survival are all benefits from using endophyte-infected tall fescue in pasture systems. Results from UAES studies with sheep and cattle consistently show that tannin- or saponin-containing foods and legume forages can partially offset the negative effects of the alkaloids in tall fescue thus increasing food intake and animal production. With regard to meat flavor, our results indicate people like pasture-reared beef from the fescue-alfalfa and the fescue-sainfoin mixtures. These findings create new avenues for coping with fescue toxicosis for producers willing to plant mixtures of forages, and they have the potential to create positive impacts on the economic and environmental aspects of producing livestock on tall fescue pastures.

Sustainability in landscapes, including decrease in water use, is becoming a critical necessity as climate change and population growth threaten to substantially limit water availability. Decreasing amenity landscape water use makes water more available for drinking and agricultural purposes. UAES researchers, in cooperation with cross-agency and multistate collaborators, are helping growers meet local and regional demands for native plant species by evaluating their water efficiency and adaptability to landscape use, and identifying efficient methods for their production. USU's work is suggestive that pot-in-pot production methods can be used cost effectively to shorten the time to sale by at least 50% for several slow-growing, high-value native plant species.

Utah, like much of the Intermountain West, is an urban state and turf grass is the largest component of most urban landscapes. USU is working to develop grasses and mixtures of grasses for these landscapes that can remain green and offer a safe surface for recreation while saving up to 50% of the water currently needed for turf grass areas. Data from UAES evaluation trials in cooperation with the National Turf grass Evaluation Program are widely used by growers and seed companies around the country for adaptation to the cool-arid West. The Turfgrass IPM Advisory continues to provide county agents with a resource to help in their programs and their work with the public related to turfgrass management. Utahns have a better understanding of turfgrass management and the resources that it requires. With a better understanding of turfgrass requirements, the overuse of resources such as water, nutrients, and pesticides for its management is lessened.

USU organized and spoke at High Tunnel Workshops in Utah, Nevada and New Mexico; held Onion Association Winter Meetings and summer field days; organized and participated in the Diversified Ag Conference. Growers are adopting high tunnels technologies since this allows crop production outside the normal periods. A survey of participants in the high tunnel workshop showed that 100% gained new knowledge, and 96% gained a new skill. A total of 96% of the participants indicated they would use some aspect of the training in their farm/home operation in the next year. Participants indicated they planned to share some aspect of the training with over 1,000 people in the next year.

Onion growers listed the following improvements they have made as a result of previous meetings and tours: weed control, variety trial, thrips scouting, awareness of iris yellow spot virus disease, and reduced nitrogen use. The growers at the onion tour indicated that they really liked the format of several brief presentations at each tour stop. The growers seemed most interested in Movento insecticide, trap crops for thrips, and moisture monitoring.

The seasonal timing of infestation of Utah small grain fields by the cereal leaf beetle, and of parasitism of this pest by its major natural enemy (a parasitic wasp), has been quantified using degree-days. This strengthens predictive ability for anticipating pest damage and acting to prevent it, as pest

management decisions can readily be based now on phenology rather than calendar date. Major factors that limit parasitism of the cereal leaf beetle also have been assessed, including the practice of fall tillage which greatly reduces overwintering survival of the parasitoid in the soil. In a field experiment, fall tillage reduced peak parasitism of the beetle the following spring from 66% in the absence of tillage to 19% where the soil had been tilled. Growers should carefully consider the need for fall tillage of small in light of these findings.

Asparagus acreage in Utah now exceeds 30 acres. Consumer demand is strong and prices range from \$2-2.50/lb. Growers report excellent yields in 2009 with many getting more than 3500 lb/A. About 20 acres are being harvested all season with returns of \$6000/acre (prior to expenses). UAES continues to offer information on organics at different workshops. UAES research continues to show that tomato and lettuce yields in organic systems are higher than those in non-organic systems. Tunnels allow the production of produce (tomato) on-farm to more than 44 weeks using this system. Tomato growers in Davis Co. grow from March to November; get prices ranging from \$2-3.50/lb at farmers markets and yields of 2-3 lbs/square foot. This works out to \$4-10 per square foot. Several growers are now growing tunnel house strawberries with very good success and getting returns \$3.50-4.50/lb for the berries in the early season.

UAES scientists have shown animals can mix forages containing different plant secondary compounds, reach finish weight at pasture, and produce beef with improved health properties at a lower cost. Furthermore, research has suggested there are trade-offs - which animals sense - between fescue quality and concentration of alkaloids. Findings from this project suggest parasitized sheep are able to increase preference for tannin-containing forages. This is important because if parasitized herbivores learn to self-medicate, this could aid in the development of sustainable management strategies aimed at treating sick animals at pasture. Results suggest that through early experience animals could be managed to better accept new feeds and environments avoiding important losses which occur when animals are introduced to new feeds and locations (e.g., dairies, feedlots).

The radiation hybrid (RH) map for the sheep has been expanded to include 2,613 markers spaced approximately every 1.0 to 1.5 megabases apart. This map is now being used for fine-mapping economically important traits, such as parasite resistance and out-of-season breeding. The assembled sequence scaffolds cover approximately 92% of the ovine genome and contain 2.71 Giga bases of sequence obtained from one male and one female Texel sheep. In addition to the reference assembly, about 5 million single nucleotide polymorphisms (SNPs) were identified. These SNPs will be important for tracing genetic differences among sheep.

UAES scientists have shown that the stock market tended to overreact to the U. S. Bovine spongiform encephalopathy (BSE) announcement because it was a surprise to the markets. However, once it became clear that the BSE case appeared to be an isolated incident and that U. S. consumers did not have a massive negative reaction to the announcement, stock prices rebounded. Stock prices for companies selling farm products, wholesale food items, processed and packaged goods, meat products, and restaurants all had a negative reaction to the BSE announcement, while dairy and major diversified food companies showed no significant reaction to the announcement. The analysis of the effects of the BSE announcement on prices along the marketing chain for beef, pork, and chicken indicated that in the short-run that the BSE announcement had a negative impact on the farm-level and wholesale-level prices for beef and also had a negative impact on the farm, wholesale, and retail levels for pork. Wholesale-level prices for chicken experienced a positive uptick as a result of the BSE announcement while retail chicken prices appeared to be unaffected by the announcement.

A UAES case study for John Deere's operations in China examined the experience of a major American-based machinery manufacturer in China and how the changing structure of Chinese agriculture and government policy in China toward the machinery supply chain appear to offer evidence of a growing market for farm machinery in China. The findings of this research demonstrated the rapid change occurring in each of these areas as well as the features unique to the Chinese market. Particular challenges in China for equipment manufacturers are related to government relations and regulations and the protection of intellectual property rights.

UCES and UAES are involved in a wide array of studies and programs related to animal

management systems. Producers report that researchbased information provided by USU Extension helps them plan their livestock marketing strategies as well as their cropping strategies. Information and training in QuickBooks, balanced rations, control of noxious weeds, and cost/benefit analysis have helped farmers to cut costs and improve production. As a result of these activities farmers attending USU Extension programs are spending more time looking at their operations and finding ways to cut costs and improve production.

Master Beef Manager Classes were held by USU Extension. Topics taught were livestock handling and facilities, bio-security, and financial and production record keeping. Beef producers learned relevant topics for sustained and profitable production. Producer understanding as measured by a pre- and post-workshop evaluation indicated that understanding increased ($p < .05$) for all 15 workshop topics taught.

One other valuable result of this workshop is that by mixing the producers, students and personnel from the packing industry together in working groups, each comes away with a better understanding of the challenges the others face and a greater appreciation of the necessity of each segment of the industry. Additionally, since the course is very much a 'hands on' type course, the participants are able to more clearly see how they fit into the overall industry.

Beef Quality Assurance (BQA) continues to be one of our major beef themes in the state of Utah. The NCBA beef audits have determined that if beef producers utilized specific management practices as outlined by the BQA program they could capture up to \$125 more per animal. In Utah this could provide millions of dollars into local economies.

UCES and UAES are involved in veterinary programs; poultry diseases; animal disease case investigations; disease pathogenesis in farmed fish species; emerging and exotic infectious disease; bovine mastitis and mastitis resistance to enhance dairy food safety; and epidemiology. UAES contributes to a greater understanding of the mechanisms of action and economic benefits from the use of J5 vaccine against coli form bovine mastitis. Larger and higher producing dairy farms continue to adopt the use of J5 vaccine. The results suggest that even if a dairy farm with mycoplasma mastitis in the herd has mycoplasma-positive bedding or mycoplasma-positive recycled bedding, it can be used under cows without transmitting the disease to uninfected cows. The savings from not purchasing all new bedding materials such as sand from a sand quarry can readily be \$1 - 4 million per year per farm.

In 2010, 7,365 cases were accessed at the UVDL, which required approximately 150,000 individual assays. In addition to the written reports, most cases required at least one, and often more, phone contacts. This means that UVDL personnel had direct one-on-one contact (often repeated) with more than 7,000 Utah citizens this past year.

CLIMATE CHANGE AND NATURAL RESOURCES

Satellitederived remotely sensed data (Landsat and ASTER) and digital elevation models were shown to be useful for mapping soils in mapping 200,000 acres of rangeland in Beaver County, Utah, and 20,000 acres of rangeland in southern Nevada in a UAES research effort. This has the potential to significantly reduce vegetation identification costs for large and small areas. This mapping procedure has also allowed large areas of at least 3 national forests to be screened for weeds and other vegetation types.

Education and research results on landscape irrigation and particularly turf grass irrigation are being conveyed directly to federal and state agencies as well as water purveyors. Since 2004, these findings have helped to generate a 13% decrease in statewide water use.

UAES scientists have created individual species water budgets for native and non-native plants in a study site. This work is showing that non-native plant communities use shallow soil water early in the growing season and that native plant communities rely more on deeper soil water later in the season. This supports previous work done in this ecosystem which suggested that early season water by non-native may prevent the establishment of natives in non-native fields. These studies suggest that watering non-native fields may be important in restoring natives to these ecosystems.

A UAES/UCES project examines the value and safety of using compost as a soil amendment for crops and conditions present in Utah demonstrate that disposal of animal wastes on agricultural land is likely to continue as the primary beneficial mode of using the resource. Current estimates of

organic/transitional producers in Utah are 150 operations. Current market value of compost in Northern Utah is approximately \$25 per ton for bulk agricultural use to \$65 per ton for wholesale bagged product for the retail market. Annual production of compost on Utah livestock operations ranges from 100 tons to 10,000 tons.

Recent results by UAES scientists are expected to have a strong impact on statewide river management and policy. The recent decrease in field erosion documented in the Lake Pepin sediment core indicates that conservation practices have been somewhat successful in reducing agricultural erosion. However, the increase in non-field sediment indicates that changes in hydrology from a combination of climate change, systematic changes in cropping patterns, and enhanced tile and ditch drainage systems are amplifying erosion of near-channel sediment sources. This finding calls for a paradigm shift in conservation efforts to focus on management of the hydrologic regime and specifically those natural and human-induced factors that are amplifying erosion of near-channel sediment sources.

As Utah's water needs continue to grow, the Slow the Flow program continues to be a great asset to Utah residents. With a grant for over \$89,000.00 from the Central Utah Water Conservancy District, data is compiled from each resident and a summary is made over the past year and the future 3 to 5 years. This documents how much water is conserved by individuals who participate in the Slow the Flow program. So far participating residents save 25-28 percent of their water use on their outside landscapes.

During the summer of 2010 the USU Extension Service and the Central Iron County Water Conservancy District received a grant to conduct water audits in Iron County, Utah. The program consisted of a walk-through evaluation of the homeowner's sprinkler system, followed by simple tests used to determine the amount of water being applied to the landscape, and how evenly that water was being applied. Following the audit, the participant was presented with a report explaining problems found during the visit that may be contributing to a lower than desired distribution uniformity. Examples included: poor design, high/low water pressure, damaged irrigation components and improper cultural practices. A customized watering schedule was created for each participant, based on the information collected. Of the 90 lawns evaluated, 59 were being over watered, by an average of 41%. The other 31 lawns were either being under watered, watered properly, or did not have an existing irrigation schedule in place. Once the 2010 program is completed, water billing data for each client will be analyzed to determine the effectiveness of this program on reducing outdoor water use. This was an amazing program supporting water conservation in Iron County.

Various nurseries have incorporated the pot-in-pot production approach into their respective operations due to ongoing UAES research and UCES efforts. If low maintenance turf grasses can be grown economically and successfully transplanted, the grass mixtures we identified will be used in a variety of urban landscapes, providing diversity as well as lower inputs of water and labor.

UAES scientists have been working on an assessment and enhancement of the impact of biological control insects (predators and parasitoids of insect pests, and weed-feeding insects) on major pest species (insects and weeds) in Utah alfalfa, small grains, and rangelands. Use of food sprays as a pest management tool to enhance parasitism of the cereal leaf beetle has been developed. In field experiments with targeted, early-season sugar provisioning, parasitism of the beetle was increased from 4-8% occurring naturally to 23-31% when sugar was applied. Insects introduced as biological control agents of squarrose knapweed on Utah rangelands have been demonstrated to reduce significantly this weed's reproductive success. Seed production throughout the area of knapweed infestation has now been reduced by 69% compared to the seed production that would have occurred in the absence of the biocontrol agents, as based on measured rates of insect attack and comparison of seed production in seedheads subject to or escaping attack. The importance of parasitic wasps in reducing numbers of a major pest of sagebrush in Utah (a moth) has been identified and quantified on lands owned and managed by the State of Utah (Division of Wildlife Resources) for elk and cattle; the combined activities of the three most abundant parasitic wasp species results in up to 80% parasitism of moths at individual sites. The overall impact of these efforts has been to contribute to more effective biological control of pest insects and weeds so as to enhance agricultural productivity while reducing the need (and associated economic and environmental costs) for pesticide application.

Many farmers in western Emery County have converted from furrow to sprinkler irrigation in the past

five years through participation in the Colorado River Salinity Program. Over two hundred farmers have been trained in the past five years in this ongoing program. All farmers who have been trained have been able to certify, through their records, that they are operating their sprinkler systems properly. Participating farmers report water savings of 40 to 50%, and yield increases of up to 30% when converting from furrow to sprinkler irrigation.

UAES scientists have provided new information about a plant pathogen (Woad Rust) that has potential for biocontrol of Dyers Woad. One outcome of the work is the finding that, to be able to infect woad, this pathogen suppresses the plant's defense mechanisms during infection. This is significant because we can now use defense suppression as a criterion for selecting more effective biocontrol strains of the pathogen or devise ways to further suppress plant defenses while applying the biocontrol agent. Another outcome of this project is that it showed that mild environmental stresses reduce disease caused by Woad Rust. This information is vital because biocontrol agents are developed under carefully controlled conditions, while weeds in natural environments are constantly subjected to environmental stress. It explains why biocontrol agents that work well in a greenhouse often do poorly in the field. Thus, an impact of this research is that future development of biocontrol agents for woad must consider the effect of environmental stress on their efficacy. A third outcome of this work is that natural populations of Woad Rust and its relatives comprise several unknown species and that the woad pathogen is potentially undescribed. This is important scientifically because it demonstrates that current morphological methods for identifying these fungi are inadequate and molecular analysis is needed to understand their taxonomy.

The Utah Master Naturalist Program, on average, nearly doubled the knowledge of the participants and they strongly agreed that the UMNP has inspired them to learn and explore more of Utah's natural world.

The development of a digital, graphical interface between the Forest Vegetation Simulator computer model and species-specific DMDs is an important outcome of this project. The graphical interface provides, for the first time, an effective and user-friendly means of quickly displaying forest stand density management alternatives onto DMDs. The software is now being used by silviculturists to facilitate effective communication with their various constituents (e.g., landowners, and other resource professionals). Tools for effective management of forest stands developed in this project have been adopted by state, federal and tribal forest land managers for management of more than a million acres of subalpine forests throughout the Intermountain West.

Best management practices to reduce nutrient inputs to water bodies cost between \$500,000 and \$1,000,000 each year. Research based riparian loading models and UCES training on more effective monitoring will result in more targeted and effective use of these funds with measurable improvements in water quality. Citizen monitoring of 24 Utah lakes will allow the state to protect these lakes from over fertilization.

Genetic diversity data for Snake River wheatgrass, with the possible exception of the PI's originating from Enterprise, OR, suggest that all other collections, cultivars, and Syn-1 population are not genetically different and should be treated as a common gene pool. These findings are significant given the increased emphasis placed on the need to utilize locally collected materials and the concern about improving native grasses and their effects on local populations. At least within Snake River wheatgrass, it seems possible to increase through selection traits that will enhance Snake River wheatgrasses ability to establish on semiarid rangelands and successfully compete with invasive annuals such as cheatgrass and medusahead without affecting the overall genetic makeup of the native populations.

Beaver County water quality educational programs have made a difference in Beaver County. Sixty percent of the farmers in the Beaver River Watershed have participated in one or more of our cost share or educational programs. These programs have reduced the amount of manure and sediment entering the Beaver River and Minersville Reservoir. Many of the farmers have improved their irrigation systems by installing pivots. Other farmers have improved the pastures and rangeland by controlling sagebrush and noxious weeds and planting improved varieties of grass.

Research related to carbon sequestration shows that a change in knowledge is occurring. Based on the pilot survey, the participants of the project have gained a preliminary understanding of Utah rangeland ownership conditions, rangeland owners' knowledge of and views on carbon sequestration, and their initial

willingness to participate in a carbon sequestration program. Preliminary findings from the survey include the following: 1) acreage varied and income level was fairly low; however, they did not affect likelihood of engagement; 2) respondents' awareness was generally low and views were negative; however, half still reported "likely to engage in carbon sequestration activities/programs;" 3) more awareness of and positive view towards carbon sequestration, higher likelihood of engagement; 4) environmentally sound land management and tax credits are both considered important benefits; reducing global warming was considered the least important benefit; and 5) there was a disconnection between respondents' perceptions of important benefits and their likelihood of engagement.

Invasive weeds are one of the greatest threats to range resources in the West. Recommendations from the latest Utah-Montana-Wyoming Weed Management Handbook provide hundreds of Utah land managers with guidance for designing effective control programs against specific invasive weed problems. One of the largest existing and expanding invasive weed is cheatgrass. UAES research indicates that targeted cattle grazing at the appropriate phenological stage in spring can reduce cheatgrass biomass, reduce the density of viable cheatgrass seeds in the seed bank, and reduce the dominance of cheatgrass in the aboveground plant community. Thus, cattle, like goats and sheep, have the potential to be used as a biological tool to help break the cheatgrass-fire cycle affecting many degraded (former) sagebrush communities, and help set the stage for re-vegetation treatments to re-establish more diverse and desirable plant communities.

UAES scientists (in cooperation with those from other stations and numerous federal partners) have developed new methodologies more sensitive to issues of spatial scale, and advanced techniques incorporating the latest in GPS, GIS and digital image analysis. These approaches are more accurate by removing observer bias and are considerably more efficient in the field, saving staff time and park financial resources. For example, in Kenai Fjords national park, the refinements of field methods have allowed the park to employ ranger staff, as opposed to natural resource specialists, to conduct the field assessments. This has resulted in an annual savings to the park of approximately \$15,000 in staff time and logistic support for what was previously a separate field trip with additional staff. Our approaches also provide a seamless integration with park GIS and Access databases, a previous shortcoming, again resulting in the financial savings of approximately \$5,000 per year due to reduced specialist staff time.

Significant advances have been made in the integration of social and ecological research toward the goal of providing a model of sustainable use in parks and public lands. Combined with concurrent ecological research, these efforts represent a significant step forward toward an integrated model of applied research in parks and protected areas. An outcome of this work is manifest in Rocky Mountain National Park where managers have used our findings to develop a suite of alternative visitor transportation strategies that will be implemented over the next several years to alleviate visitor crowding and resource degradation--two important impacts to visitors of the Park. This strategy provides park managers with key decisions points as to when thresholds of acceptability of resource conditions have been exceeded thus allowing for changes in management actions and enhances both visitor experience and resource protection.

Literally hundreds of national parks, national forests, BLM areas and private lands have programs of visitor site monitoring, much of which is based on systems of monitoring developed in the 1960's and 1980's. The approach developed and tested successfully in this work will make campsite monitoring more effective and managerially relevant. The improved approach has currently been implemented in the Chugach National Forest and Kenai Fjords National Park in Alaska, in Rocky Mountain National Park and will be applied in Zion National Park in the upcoming year. This improvement is significant to land management agencies such as the National Park Service who continuously struggle to obtain enough funding to accomplish data gathering and analysis tasks needed for basic recreation management.

Assistance to family forests helps protect up 20 percent of Utah's forest land. Urban forestry programs, which are a product of both UAES research and USU Extension efforts, include educating cities on tree plantings that reduce fire hazards and improve value of homes. USU Extension's utility pruning outreach efforts help reduce costs associated with power outages (estimated to cost the U.S. economy \$119 billion annually). The USU forestry webcast series is turning out to be a good way to reach a widely scattered and diverse audience on a regular basis. The Forest Service paid USU \$1,000 to help defray

expenses on the USFS FIA Users Group webcast, and they said that it is a very good way for them to reach out to this group. It saves them thousands of dollars and a lot of time. USU is involved in the Restoring the West Conference with 99% of the 167 attendees having improved knowledge, skills (79%), and ability to manage land (84%). These attendees manage 728 thousand acres each. Extension forestry website visits numbered 71,335 this year, up by 9.2% over last year. Tree Browser website visits totaled 11,752, up 9.7% over last year. Advice given to Cedars HOA on a failed planting of 150 3"+ caliper London planetrees helped them recoup a \$22,500 loss and have a better planting the next time. A UAES scientist's analysis of Forest Inventory and Analysis (FIA) data importantly suggests that the perceived increase in aspen mortality is not occurring at state or regional scales.

An important finding of how climate change drives fluctuations in the growth rate of important sagebrush steppe species is that the type of precipitation (rain vs. snow) may be as important as the amount of precipitation, with high snow years favoring native species and low snow years favoring cheatgrass, an invasive annual species.

To enhance wildlife management recreational opportunities and alternate incomes from private lands, USU Extension program facilitated the establishment of the Cooperative Wildlife Management Program Unit (CWMU) and a business association of over 200 farm and ranch operations encompassing over 2 million acres of private rangeland in Utah. Annually, the Cooperative Wildlife Management Unit program generates over \$20 million in new revenue for Utah landowners and provides free access to over 4,000 Utah hunters annually to high quality big game hunting opportunities.

The Bureau of Land Management has reportedly spent approximately \$30 million to extinguish and re-vegetate the 335,000 acres that comprised the largest single wildfire in Utah history. Monitoring the success of this investment will be heavily dependent on remote sensing and its ability to track changes in vegetation in semi-arid landscapes.

The impacts of this research will be to provide the BLM and other land management agencies the capacity to holistically monitor large landscapes in a cost efficient manner. While not a replacement for field work, remote sensing can provide a whole-landscape perspective that field monitoring cannot. The estimated cost of this project is 1/2 of 1% the cost of fighting and re-vegetating the fire area.

To protect and keep Sage Grouse habitat in Utah, UCES and UAES have organized local work groups which have taken the lead in protecting sage grouse habitat. USU continues implementation of 10 local working group sage-grouse conservation plans. Plan implementation efforts have engaged over 2000 stakeholders in over 50 field tours, quarterly meetings, and workshops. These efforts have resulted in the implementation and evaluation of management projects in 13 counties, encompassing over 50,000 acres. As a result, stable and increasing Sage Grouse populations are now being seen in multiple counties across the state.

Family Nights at Utah Botanical Center (UBC) introduces members of the local community to the values of natural resources, wetlands and horticulture. During these visits, they have had the opportunity to learn about the conservation of natural resources (primarily energy and water), wetland ecology, and horticulture. As an added benefit, these visitors have had these experiences as a family, which, ideally, contributes to a change in attitude towards and an adoption of conservation practices as a family group, rather than simply as individuals.

UCES water quality program provided over 7,500 kids with water quality educational activities (at least an hour in length) through classroom visits, field days and camps and increased the skills of 105 educators, who each will relay these messages to hundreds of children each year. Follow up surveys with educators indicate that about 40% continue to use these methods in their classrooms, reaching thousands of additional students each year. UAES research and UCES activities have also contributed to a cleaner Bear River drainage system which runs through Rich, Cache, and Box Elder Counties.

Additional social benefits have been derived from the centralization of historical and current weather and climate data. Such data enable better weather forecasting models and are also extremely helpful in identifying longrun climate data in response to concerns about global warming and its potential impacts on the Intermountain West.

UCES and UAES have saved Utah cities money by helping them plan good and beneficial tree plantings. This in turn saves the city tax payers money and improves the quality of live for the

citizens. Cost savings by cities are estimated at \$5,000 to \$10,000 per city. This savings comes in proper tree selection and proper pest diagnosis and treatment.

SUSTAINABLE ENERGY

SUNDERLAND DAIRY MANURE DIGESTER RETROFIT: USU Extension converted a failed project implementing induced blanket reactor (IBR) technology to a successfully operating system. The manure digester is a renewable, alternative energy project that is capable of producing 48kW/hr of 'green' electricity. The digester produces bio-gas containing 66% methane. Since commissioning in June 2009 the engine generator set has produced 180mW of electricity. Sunderland's Dairy is being paid \$.032/kW or \$5760 to date. The electricity to consumers in Utah is valued at \$13,500 (\$.075). The same amount of electricity is valued at \$32,400 (\$.18) in 'green' markets such as California when considered as being produced from a renewable energy source. The digester system cost about \$875,000 to construct and modify. Effluent heat exchanger provides a 5 degree F increase in manure temperature at an 8.3 gal/min in feed rate.

During 2010, USU and UDAF worked together to offer energy audits to farms and signed a MOU to cover the expenses of energy audits. One of the four farms audited invested in improved energy efficient equipment and it is estimated that almost 15% of the \$6,000,000 spent on improved poultry production (at two locations) was to improve (lower) energy use.

UAES is involved in a project to develop a single cell phototrophic bacterium that can turn carbon dioxide and light into compounds that would be direct substitutes for gasoline and diesel fuel. USU discovered a photosynthetic bacterium that makes high quantities of heptadecene (C17) diesel substitute. The near term aim of this project is to characterize the diesel compounds made by these bacteria and to begin to understand the enzymes that create this compound. This research is expected to impact our knowledge of renewable liquid transportation fuel production using sunlight and CO₂ and phototrophic microbes. Little is known about using cyanobacteria to make liquid fuels, and USU has discovered one strain that makes C17 in considerable quantities. USU will determine conditions that result in the production of this fuel. If fully realized, this could provide a novel way to make biofuels using phototrophic microbes.

CHILDHOOD OBESITY, NUTRITION AND COMMUNITY

Food \$ense is Utah's Supplemental Nutrition Assistant Program - Education (SNAPEd). In Fiscal year 2010 the program grew approximately 30%, reaching over 11,398 adult participants and 16,386 youth participants. Participants provide information on their personal demographics, their intent to change behavior after participating in a class and their behavior change (after a series of lessons). In 2010 there were 20 behaviors where participants showed significant improvements. These areas were: planned meals ahead of time, compared prices when shopping, enough food until the end of the month, grocery shop with a list, refrigerate meat and dairy within 2 hours of shopping, thaw foods properly do not thaw frozen foods at room temperatures, make food purchases based on healthy choices, prepare foods without adding salt, read Nutrition Facts Labels before purchasing, children in household eat something within 2 hours of waking, wash hands before food preparation or eating, prepare raw foods separately from other foods, choose to be physically active at least 30 minutes 5 days a week, choose to walk, take the stairs, or be active in other ways, prepare meals at home at least 3 times a week, eat meals together as a family at least 3 times a week, eat at least 3 servings vegetables a day, eat at least 2 servings of fruit a day, eat at least 2 servings of dairy a day, and replace saturated and transfat with heart healthy fat.

Financial resource management and bankruptcy prevention education is seen as priority programming by local advisory councils and county residents. Financial resource management concepts were provided to residents through office visits, phone calls, workshops, classes, special events, publications, news columns and newsletter articles. Finance workshops, courses and special events conducted, included Take Charge of Your Money Financial Fitness course, Earned Income Tax Credit

education, Earn It Keep It Save It program, Utah Saves Campaign, Volunteer Income Tax Assistance (VITA) program, Individual Development Account (IDA) classes, Youth Finance Camps, and a Financial Wellbeing/Health Fair. USU Extension offers many of the educational workshops and classes within the Utah Saves campaign. These courses and activities are based on work done in the UAES, as well as other researchbased sources.

Research conducted in the past year improves our understanding of the migration of Hispanics within the United States. Although much past research had compared the levels of primary and repeat migration across numerous socioeconomic groups within the United States there was a gap in research aimed at determining if Mexican heritage Hispanics had higher or lower levels of primary or repeat migration than other Hispanics groups in the United States. Mexicans make up 64 percent of Hispanics in the United States. The research supports past research showing low rates of primary migration (first-time migration) and relatively high rates of repeat migration for Mexican heritage Hispanics and other Hispanics in the United States. However, past research on these types of migration suggests widespread differences generally exist between social and cultural groups and comparisons of Hispanic groupings with one another along several dimensions suggests differences in migration would exist between Hispanics of distinct national origin groupings. Our research does not support these expectations. The research also contributes to the growing body of research on the increased levels of migration by Hispanics to new destinations, areas of the country to which few Hispanics had migrated prior to 1990.

Utah Individual Development Account Network (UIDAN), a national program was originally brought to Utah by Utah Issues and is currently housed with AAA Fair Credit Foundation. UCES fostered a partnership with Utah Issues, AAA Fair Credit, and others to have UCES as the financial educators of this program. An eight to ten hour basic financial course is a requirement for UIDAN applicants. This financial course is taught to low-income, working adults who qualify into this national program to build wealth. The individual saves money towards a home, a secondary education or a small business and their money is matched 3 to 1.

Stepfamilies are becoming an increasingly common family formation in Utah. There are, however, few educational programs that help couples prepare for remarriage and/or enhance their relationships in the context of stepfamilyliving. UAES research is underway in an effort to determine if urban stepfamily relationships are significantly different from rural stepfamily situations. The outcome and impacts have been extremely positive. The adults who attended the stepfamily and remarriage education classes demonstrated statistically significant increases in knowledge and skills related to healthy relationships. Participants also experienced statistically significant increases in relationship stability and satisfaction. Overall, participants reported that remarriage and stepfamily education classes were very helpful. In the qualitative interviews, participants reported various benefits for their couple relationship, family relationships, and with their children.

UAES scientists have been the first to present evidence that children's proficiency in mathematics, while directly predicted by language skills, is fully mediated by children's early phonological awareness skills. Relative to earlier work, UAES scientists have discovered, disappointingly, that child care providers' teaching behaviors with children change as a result of professional training, but the change persists only about 6 weeks to 2 months.

FOOD SAFETY- PRODUCTION AND SAFETY OF FOOD PRODUCTS

New and improved foods have a tremendous ability to positively affect human health. Projects at UAES focus on improving nutrition and adding bioactive properties to foods. Projects include minimizing trans-fatty acids, utilizing whey proteins, and examining the nutrition of milk fat in food systems. Polyunsaturated fatty acids and milk fat blends were examined to replace trans-fatty acids in foods. The effect of processing conditions and the stability of fats have been partially characterized. Another project seeks to provide a better understanding of how bifidobacteria respond to stress conditions commonly encountered in food systems, and identify potential strategies to enhance longterm cell survival. Findings reinforce our fundamental understanding of the genetics and physiology of these bacteria in foods. Wheybased fiber was examined as a replacement for cornstarch in snack foods. Data indicates the

possibility to incorporate dietary fiber at levels of approximately 20%. Lastly, milk fat globules were examined for better characterization. Initial results indicate there are at least two different classes of milk fat in relation to triglyceride content. Further research is being conducted to determine any nutritional benefits. Through research in this area, consumers will be provided with an improved selection of high quality, low cost, safe, and nutritious foods. Food production and processing to meet the needs of today's consumers will enhance health and well-being and improve the nation's economy. Understanding the structural and functional relationships among various components of foods will allow better control and enhancement of food quality during processing, storage distribution, and preparation for consumption.

The Centers for Disease Control and Prevention (CDC) estimates that in the United States 76 million foodborne illnesses occur every year. This may cost as high as 40 billion dollars annually due to lost productivity and direct health expenses. While most people believe that manufacturers are the main source of foodborne illness the truth is that greater than 70% are caused in food service and in the home. Furthermore, Utah is disproportionately high, compared to the rest of the county, in consumers that participate in home food preservation and storage. UAES researchers and UCES staff have major programs aimed at home food safety and retailfoodservice food safety. Both programs are addressed at the state level and at the county level. The home food safety program includes home food preservation, storage, and food preparation. Each County provides direct educational programming based on researchbased results, such as seminars, to consumers to increase food safety knowledge and change behavior. Educational programs include safe hand washing, safe home canning, safe food storage, and safe food preparation (cook, clean, chill, and separate). In addition, state and local personnel answer several thousand direct consumer inquiries annually via telephone and email.

Knowledge gained from UAES studies on food safety has direct application for controlling important food-borne pathogens thereby leading to a safer food supply. Food poisoning costs the United States \$152 billion dollars annually, \$505 for every American. Food safety is the highest rated non-economic issue for United States consumers, and they indicate a willingness to pay up to 30 percent more for products with a safety certification label. That translates into an economic impact of over \$170 billion based on yearly supermarket food sales alone.

For retail and foodservice food safety, USU provides a Food Safety Manager's Certification Course. Exams are bilingual to assist Spanishspeaking foodservice managers. Each county in Utah supports the course and provides access to materials and testing. Safe food behaviors at the consumer and retailfoodservice level will reduce foodborne illness cases annually. Safe and proper canning will save a few lives of persons that otherwise may have contracted botulism. Educated and knowledgeable food service managers play a vital role in the safe food production at this level of the farm-to-fork food chain. The CDC has determined that foodservice operators who have passed a Food Safety Manager's Certification are less likely to engage in foodborne illness risk behaviors.

UAES scientists have developed new meat and dairy products that reduce the likelihood of foodborne contaminants and ensure relevant new foods enriched in vitamins and minerals, while adding less fat. Research efforts are also underway to identify means of various metabolic processes so as to enhance human health.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	187.0	0.0	120.0	0.0
Actual	109.0	0.0	60.5	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

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

2. Brief Explanation

Scientific Peer Review Process - Agricultural Experiment Station: The scientific peer-review process within the agricultural experiment station has involved two steps. The first step included a review by two scientists requested by the principal investigator (PI). These two scientists provided written comments regarding the proposal which were then returned to the PI for evaluation and response. Prior to submission to the experiment station, the PI's department head also reviewed and signed off on the proposal. Once the proposal reached the station, two additional scientific peer reviews were 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). These external reviews were returned to the experiment station and the PI's were subsequently asked to respond to issues raised by these reviewers. The PI then modified her/his 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 was used approximately 15% of the time.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their 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 individuals
- Survey of the general public

Brief explanation.

The media sources are frequently used by Utah counties to encourage county residents to participate in public meetings and listening sessions. Use of the local newspaper and radio through public service announcements and paid advertisements are the two primary techniques applied in media use. Counties targeted traditional stakeholders through letter/poster invitations to participate in public meetings and listening sessions. Such announcements are often placed in public places, on bulletin boards, and other locales frequented by non-traditional audiences. Non-traditional stakeholder groups were also specifically invited to participate in public meetings and listening sessions. Inviting individual stakeholder and non-traditional stakeholder individuals to participate in public meetings and listening sessions is also a significant means for engaging them in discussions. Surveys serve as another means for contacting stakeholders.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

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

Brief explanation.

The Utah Agricultural Experiment Station uses an advisory group that meets as needed to provide much needed input from the public and private sectors. Utah Extension utilizes advisory committees as the primary means of identifying stakeholder individuals and groups to collect program input. Principle council and advisory groups utilized included such groups as teen councils, horse and livestock councils, Workforce Services, Interagency Coalitions, community religious leaders, United Way, Utah Saves Advisory Boards, Utah Fair Boards, Utah Farm Bureau and Farmers Union, after-school coalitions and previous recipients of Extension programs have been utilized. Counties used focus groups and open listening sessions as means to identify groups and individual stakeholders. Needs assessments and surveys provided another primary means of identifying individuals and groups though who input was collected.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods 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 individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

Utah Extension and Utah Experiment Station find that meeting with traditional stakeholders, often times in expansion and review settings and in advisory councils are effective method for identifying program and administrative issues important to county residents. Meeting with traditional stakeholders as part of a group and also meeting with them individually was an effective method for getting input. Surveying traditional stakeholder groups and individuals, meeting specifically with non-traditional groups and individuals and with invited selected individuals from the general public was also used. Open meetings advertised to the public were also a means of obtaining input.

3. A statement of how the input will be considered

- 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

Brief explanation.

Utah Extension and Utah Experiment Station find that meeting with traditional stakeholders, often times in expansion and review settings and in advisory councils are effective method for identifying program and administrative issues important to county residents. Meeting with traditional stakeholders and also meeting with them individually was an effective method for getting input. Surveying traditional stakeholder groups and individuals, meeting specifically with non-traditional groups and individuals and with invited selected individuals from the general public was also used. Open meetings advertised to the public were also a means of obtaining input.

Brief Explanation of what you learned from your Stakeholders

The input received from stakeholders was utilized most to redirect Experiment Station and Extension programs, to gather information on emerging issues, and to set priorities as a unified Extension and Experiment Station organization. With an ever growing metro population along the Wasatch Front in Utah this input has been valuable in redirecting program emphasis areas to reflect the needs of metropolitan populations. To a lesser extent input was applied to Extension programs in redirecting research programs, in the hiring of staff and in the action plans of the county. These inputs frequently inform Extension through influencing recruitment and hiring practices and inform Extension on the types of research that stakeholders perceive as critical to their need. The Experiment station uses stakeholder input provided by Extension and advisory group input to make changes in the research program.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1670143	0	2070257	0

2. Totaled Actual dollars from Planned Programs Inputs				
Extension			Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1670143	0	1977489	0
Actual Matching	1670143	0	1907689	0
Actual All Other	0	0	0	0
Total Actual Expended	3340286	0	3885178	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	{No Data Entered}	{No Data Entered}	{No Data Entered}	{No Data Entered}

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Land Use and Sustainable Communities
2	Sustainable Plant Communities
3	Sustained Livestock Production
4	Plant, Animal, and Microbial Genomics
5	Water and Soil Conservation and Uses
6	Natural Resource Systems and the Environment
7	Production, Marketing, Trade, and International Economics
8	Individuals, Families, and Communities
9	Food Safety - Food Production and Safety
10	Global Food Security and Hunger
11	Climate Change
12	Sustainable Energy
13	Childhood Obesity, Nutrition, and Community

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Land Use and Sustainable Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
131	Alternative Uses of Land				
608	Community Resource Planning and Development				
610	Domestic Policy Analysis				
803	Sociological and Technological Change Affecting Individuals, Families, and Communities				
	Total				

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	13.0	0.0	3.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

1. Conduct research experiments and/or develop theories that can be used to explain (a) causes for public land conflicts and potential solutions, (b) solutions to the urban expansion into rural areas and open space, and (c) conditions for continued rural community economic viability.
2. Publish studies and make presentations related to these areas of concern.
3. Conduct workshops and meetings to educate local, state, and regional stakeholders concerning these issues.
4. Deliver educational and informational services through various media.
5. Develop educational resources related to rural economic viability for community leaders and other stakeholders
6. Provide for local training in principles developed that are related to this area of study.
7. Conduct design activities (for a park, a Main Street revitalization, etc.) that will typically yield a design of variable specificity (some might be conceptual drawings, others might be more extensive).
8. Provide consultations regarding land use planning policies and their implications on growth.

2. Brief description of the target audience

The target audience for this work will be community leaders, community, state and federal policy makers, at-large public, academic units, private land holders, public land users, businesses, and local, state, and regional political leaders. Establishing joint efforts with public and private interests in the community will be important in establishing the needed credibility for adoption of recommended practices or acceptance of alternative designs.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: {No Data}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
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Actual	0	20	0
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V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of peer-reviewed journal articles and books/chapters in books extensively peer reviewed

Year	Actual
2010	0

Output #2

Output Measure

- Level of contract/grant funding

Year	Actual
2010	0

Output #3

Output Measure

- Number of graduate students trained

Year	Actual
2010	0

Output #4

Output Measure

- Number of theses/dissertations completed

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clients gaining land use and sustainable communities knowledge.
2	Number of clients who implement land use and sustainable communities practices
3	Number of communities preserving desirable community attributes

Outcome #1

1. Outcome Measures

Number of clients gaining land use and sustainable communities knowledge.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	7000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
608	Community Resource Planning and Development
610	Domestic Policy Analysis
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #2

1. Outcome Measures

Number of clients who implement land use and sustainable communities practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
608	Community Resource Planning and Development
610	Domestic Policy Analysis
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #3

1. Outcome Measures

Number of communities preserving desirable community attributes

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
608	Community Resource Planning and Development
610	Domestic Policy Analysis
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Sustainable Plant Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms				
202	Plant Genetic Resources				
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				
204	Plant Product Quality and Utility (Preharvest)				
205	Plant Management Systems				
206	Basic Plant Biology				
211	Insects, Mites, and Other Arthropods Affecting Plants				
212	Pathogens and Nematodes Affecting Plants				
213	Weeds Affecting Plants				
214	Vertebrates, Mollusks, and Other Pests Affecting Plants				
215	Biological Control of Pests Affecting Plants				
216	Integrated Pest Management Systems				
	Total				

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	50.0	0.0	10.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

- Conduct applied research experiments with plants and plant material to improve cultural practices, pest management, and other factors to enhance sustainability.
- Publish studies and make presentations on research projects.
- Conduct workshops and meetings to educate local, state, and regional stakeholders concerning progress in producing plants that are economically viable and environmentally friendly.
- Deliver educational resources through various media
- Release new plant varieties relative to this program area under plant variety protection (PVP) status.
- Expand use of Integrated Pest Management (IPM).
- Provide "Orchard Pest Advisories" on over 15 insect, mite, and pathogen pests of tree fruit and small fruit crops (commercial and home garden).
 - Provide pest diagnostic assistance and management information to county agents, state and federal partners, commercial agriculture and horticulture producers, and the general public through the Utah Plant Pest Diagnostic Laboratory.
 - Certify or recertify Pesticide Applicator Training (PAT) for pesticide applicators to apply restricted use pesticides and to comply with the Utah Pesticide Control Act and the Federal Insecticide, Fungicide, and Rodenticide Act.
 - Coordinate efforts with other states and the Western Region Pest Management Center (WRPMC) as well as CAPS.
 - Enhance the USU Master and 4-H Junior Master Gardener Programs.
 - Conserving water in the landscape through appropriate landscape management and plant selection with regard to turfgrass management. Also, conduct the Water Check program throughout the Westch Front to encourage water conservation in landscapes.
 - Develop a manual that would meet the needs of industry professionals seeking certification as a Utah Certified Nursery Professional
 - Collaborate with the Utah Nursery and Landscape Association in an annual conference and trade show to illustrate "best management practices."
 - Continue the Western SARE Program.
 - Expand the Geospatial Extension Program.
 - Utilize multiple demonstrations/applied research plots to manage weeds in agronomic crops with results reported at field days, workshops, or annual meetings.
 - Conduct research on production of biofuel stocks on dry farms and marginal lands including roadsides and brownfields.

- Conduct educational programs to assist the public in managing small acreage and in establishing vegetable and fruit gardens in response to the economic downturn.

<w:LsdException Locked='false' Priority='65' SemiHidden='false' UnhideWhenUsed='false' Name='Medium Lis

2. Brief description of the target audience

The target audience for this work would be other scientists, agricultural producers, landscapers, general public, home owners, green industry officials, professional landscape managers, turfgrass sod producers, other private businesses, and government entities that conduct work in this area.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: {No Data}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	25	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of variety or seed releases

Year	Actual
2010	0

Output #2

Output Measure

- Number of peer-reviewed journal articles and books/chapters in books extensively peer reviewed

Year	Actual
2010	0

Output #3

Output Measure

- Level of contract/grant funding

Year	Actual
2010	0

Output #4

Output Measure

- Number of graduate students or post-doctorate's trained

Year	Actual
2010	0

Output #5

Output Measure

- Number of PVP's (Plant Variety Protection) established

Year	Actual
2010	0

Output #6

Output Measure

- Number of theses/dissertations completed

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clients (growers, government agency personnel, home orchardists, and others) increasing their knowledge of sustained plant production.
2	Number of times clients (growers, government agency personnel, home orchardists, and others) implement one or more sustained plant production practice(s).
3	Percentage increase in crop cash receipts (based on 1999-2004 average aggregate receipts).
4	Percentage increase in overall crop productivity (based on 1999-2004 average aggregate output).

Outcome #1

1. Outcome Measures

Number of clients (growers, government agency personnel, home orchardists, and others) increasing their knowledge of sustained plant production.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	68000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Number of times clients (growers, government agency personnel, home orchardists, and others) implement one or more sustained plant production practice(s).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	44000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Percentage increase in crop cash receipts (based on 1999-2004 average aggregate receipts).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants

216 Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

Percentage increase in overall crop productivity (based on 1999-2004 average aggregate output).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants

215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (weeds, biofuels)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Sustained Livestock Production

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals				
302	Nutrient Utilization in Animals				
303	Genetic Improvement of Animals				
305	Animal Physiological Processes				
306	Environmental Stress in Animals				
307	Animal Management Systems				
308	Improved Animal Products (Before Harvest)				
311	Animal Diseases				
312	External Parasites and Pests of Animals				
313	Internal Parasites in Animals				
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals				
402	Engineering Systems and Equipment				
722	Zoonotic Diseases and Parasites Affecting Humans				
	Total				

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	34.0	0.0	5.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)**1. Brief description of the Activity**

NO LONGER REPORTING ON THIS PLANNED PROGRAM

The Utah Agricultural Experiment Station will:

1. Conduct research experiments and develop theories that can be used to enhance livestock production in an environmentally friendly manner.

2. Publish studies and make presentations related to this research.

3. It is expected that this research will eventually result in one patent issued in year 2011/year.

Extension will outreach to adult and youth producers and provide educational training, farm and ranch visits, and in-depth applied information on:

1. Dairy management and related topics

2. Beef Quality Assurance principles to beef producers

3. Master Beef Managers

4. Master Livestock Managers

5. Understanding and ability to keep and use farm records

6. Optimal production techniques for year round turkey production

7. The threat of foreign animal diseases and the role and methods of biosecurity for control and prevention

8. Disease and pest control

9. Agrarian and equine needs of small acreage owners

10. Sheep and goats

2. Brief description of the target audience

The target audience for this work would be local and regional livestock (primarily beef, dairy, and equine) producers, small acreage owners, 4-H youth, veterinarians, USDA, state policy makers, academic units, businesses, and local, state, and regional political leaders.

V(E). Planned Program (Outputs)**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: {No Data}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	10	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of peer-reviewed journal articles and books/chapters in books extensively peer reviewed

Year	Actual
2010	0

Output #2

Output Measure

- Level of contract/grant funding

Year	Actual
2010	0

Output #3

Output Measure

- Number of theses/dissertations completed

Year	Actual
2010	0

Output #4

Output Measure

- Graduate students and post doctorate students trained

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of agricultural animal owners increasing their knowledge of sustained animal production practices.
2	Number of times agricultural animal owners implemented one or more sustained animal production practices.
3	Improvement in livestock productivity (i.e., pounds of beef or milk produced per animal per year, expressed in percentage terms).
4	Improvement in cash receipts from livestock production relative to average of 1999-2004 production years.

Outcome #1

1. Outcome Measures

Number of agricultural animal owners increasing their knowledge of sustained animal production practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	21000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
402	Engineering Systems and Equipment

722 Zoonotic Diseases and Parasites Affecting Humans

Outcome #2

1. Outcome Measures

Number of times agricultural animal owners implemented one or more sustained animal production practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5300	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals

- 402 Engineering Systems and Equipment
- 722 Zoonotic Diseases and Parasites Affecting Humans

Outcome #3

1. Outcome Measures

Improvement in livestock productivity (i.e., pounds of beef or milk produced per animal per year, expressed in percentage terms).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases

314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #4

1. Outcome Measures

Improvement in cash receipts from livestock production relative to average of 1999-2004 production years.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems

311	Animal Diseases
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
402	Engineering Systems and Equipment
722	Zoonotic Diseases and Parasites Affecting Humans

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Diseases; Invasive Species)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Plant, Animal, and Microbial Genomics

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms				
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				
301	Reproductive Performance of Animals				
303	Genetic Improvement of Animals				
304	Animal Genome				
305	Animal Physiological Processes				
501	New and Improved Food Processing Technologies				
	Total				

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	16.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

1. Conduct research experiments and develop theories that can be used to enhance plant and animal productive efficiencies.
2. Publish studies related to these areas of concern.
3. Conduct workshops and meetings for other scientists involved in this area of research.
4. Develop applications for the research on plant and animal genomics to directly benefit producers, youths, and other scientists.

2. Brief description of the target audience

The target audience for this research will primarily be other scientists involved in genomics work but the gains achieved will eventually be available to the general public as these technologies become commercialized. Other interested parties include numerous businesses related to this area of research. The eventual end-user, i.e., the producer or food processor, will realize benefits from the research long term.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: {No Data}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	60	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of peer-reviewed journal articles and books/chapters in books extensively peer reviewed

Year	Actual
2010	0

Output #2

Output Measure

- Level of contract/grant funding

Year	Actual
2010	0

Output #3

Output Measure

- Number of graduate students or post-doctorate's trained

Year	Actual
2010	0

Output #4

Output Measure

- Number of theses/dissertations completed

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in productivity (plant and animal) per year (expressed in percentage terms) due to enhanced genetical capacity.

Outcome #1

1. Outcome Measures

Increase in productivity (plant and animal) per year (expressed in percentage terms) due to enhanced genetical capacity.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
304	Animal Genome
305	Animal Physiological Processes
501	New and Improved Food Processing Technologies

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Water and Soil Conservation and Uses

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources				
102	Soil, Plant, Water, Nutrient Relationships				
103	Management of Saline and Sodic Soils and Salinity				
104	Protect Soil from Harmful Effects of Natural Elements				
111	Conservation and Efficient Use of Water				
112	Watershed Protection and Management				
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				
205	Plant Management Systems				
213	Weeds Affecting Plants				
404	Instrumentation and Control Systems				
405	Drainage and Irrigation Systems and Facilities				
605	Natural Resource and Environmental Economics				
	Total				

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	0.0	7.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

Experiment station faculty will:

1. Conduct experiments and develop theories that can be used to enhance water efficiencies for agronomic areas and urban areas.
2. Conduct experiments and develop theories that can be used to develop a safer, more reliable supply of water for agricultural and urban consumption.
3. Publish studies related to these two areas of concern.
4. Conduct workshops and meetings to educate the "educators" concerning these issues.

Extension will outreach and partner with agricultural producers and the public to provide educational training, problem solving, and in-depth applied information on:

1. Animal Waste Management
2. Alternative methods of dealing with animal waste such as composting or digestion, especially for those animal owners with small acreages.
3. Partnering to facilitate rehabilitation of degraded watersheds and to enhance the management and water yield of specific watersheds.
4. Protecting and managing watersheds and water resources.
5. Preserve reservoirs, aquifers and other waters.
6. Conserve, manage and enhance efficient water use by agricultural, residential, commercial, and business users.
7. Derive efficient irrigation strategies and technologies.
8. Implement water-wise landscaping practices, including xeriscape use.
9. Initiate landscape water auditing.
10. Evaluate and promote plants that require less water and are drought tolerant.
11. Educate youth and adults on their role in preserving and enhancing water quality.
12. Monitor, identify problem waters, and facilitate improvement of quality through partnering efforts.
13. Enhance quality, capture, and use of storm-water.
14. Facilitate knowledge, methods, and use of gray-water.
15. Demonstrate potential of new technology for improving quality or reclaiming water.
16. Expand the knowledge of soil types and selection of appropriate plants for various types of soils, along with the amount of water available.
17. Identify areas of current or potential soil loss or reduced soil fertility and partner with other agencies to reduce and control these problems.
18. Educate producers on the important interactions of soil and irrigation as well as soil and plant type or variety, especially with respect to soil salinity.
19. Provide information on soil nutrient deficiencies and cost effective soil quality and fertility

improvements.

20. Continue demonstration projects - salt levels, soil types, alkalinity, non-traditional soil fertility amendments, fertilizer formulation efficacy, organic matter use and management.

2. Brief description of the target audience

The target audience is extension agriculture and horticulture agents, agricultural producers, home and garden owners, small acreage owners, professional landscape managers, the general public, elected officials, federal and state water and soil management agencies.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: {No Data}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	25	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of peer-reviewed journal articles and books extensively peer reviewed.

Year	Actual
2010	0

Output #2

Output Measure

- Level of contract/grant funding

Year	Actual
2010	0

Output #3

Output Measure

- Number of graduate students or post-doctorate's trained

Year	Actual
2010	0

Output #4

Output Measure

- Number of theses/dissertations completed

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clients (agricultural producers, home owners, small acreage owners and the general; public) increasing their knowledge of soil and/or water conservation.
2	Number of clients (agricultural producers, home owners, small acreage owners and the general public) implementing soil and/or water conservation practices.)
3	Decrease the percent of assessed impaired miles of rivers and streams below a given percentage.
4	Decrease the percent of assessed impaired acres of lakes, ponds, and reservoirs below a certain percentage.

Outcome #1

1. Outcome Measures

Number of clients (agricultural producers, home owners, small acreage owners and the general; public) increasing their knowledge of soil and/or water conservation.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	12300	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
103	Management of Saline and Sodic Soils and Salinity
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems
213	Weeds Affecting Plants
605	Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Number of clients (agricultural producers, home owners, small acreage owners and the general public) implementing soil and/or water conservation practices.)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
103	Management of Saline and Sodic Soils and Salinity
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems
213	Weeds Affecting Plants
605	Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

Decrease the percent of assessed impaired miles of rivers and streams below a given percentage.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	26	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
103	Management of Saline and Sodic Soils and Salinity
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems
213	Weeds Affecting Plants

605 Natural Resource and Environmental Economics

Outcome #4

1. Outcome Measures

Decrease the percent of assessed impaired acres of lakes, ponds, and reservoirs below a certain percentage.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	30	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
103	Management of Saline and Sodic Soils and Salinity
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
405	Drainage and Irrigation Systems and Facilities
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Natural Resource Systems and the Environment

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management				
121	Management of Range Resources				
122	Management and Control of Forest and Range Fires				
123	Management and Sustainability of Forest Resources				
124	Urban Forestry				
125	Agroforestry				
132	Weather and Climate				
133	Pollution Prevention and Mitigation				
134	Outdoor Recreation				
135	Aquatic and Terrestrial Wildlife				
136	Conservation of Biological Diversity				
141	Air Resource Protection and Management				
403	Waste Disposal, Recycling, and Reuse				
605	Natural Resource and Environmental Economics				
	Total				

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	6.4	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

Work will be undertaken that attempts to identify principles and practices that maximize the overall benefits from range and forest use/nonuse. Additional research will be undertaken that focuses on air quality-both protection and management of said resource. Finally, economic studies involving environmental issues, primarily management of natural resources, will be continued in order to identify potential economic strategies that will enhance the quality of life and maintain viable environments.

Extension will outreach to livestock producers, general public including youth, private land forest owners, agency personnel, special interest groups and green industry professionals to:

1. Conduct projects consultations, and workshops focusing on the role of outdoor recreation and natural resource-based tourism in relation to community development.
2. Provide information, resources, research, and expertise related to the development of outdoor recreation and natural resources-based tourism opportunities to assist in the diversification of local economies, especially in rural Utah.
3. Partner with others in education and use of resources to rehabilitate the sagebrush steppe environment.
4. Educate and partner to enable the recovery of the sage grouse, pygmy rabbit and others to avoid listing as endangered species.
5. Continue to facilitate and assist the establishment and success of local Conservation Resource Management (CRM) groups, for more local control of decisions on natural resources.
6. Educate the public with respect to the principle causes of air pollution and their role in prevention.
7. Partner with others to enable agriculture producers to meet the requirements of the EPA.
8. Provide training in practical weed inventory and mapping techniques to state and federal land managers.
9. Establish herbicide demonstration/research plots to evaluate the efficacy of these products under local conditions.
10. Determine management options that slows or stops the cycle of cheatgrass and fire on previously burned areas through range rehabilitation, seeding programs and nontraditional approaches to grazing management.
11. Educate producers and agency personnel on the need for continued range evaluation, monitoring, and management improvements and the role of grazing management in sustainable resource management.
12. Educate the public on responsible use and the value of multiple uses on rangelands.
13. Demonstrate the need for controlled logging, thinning and cleaning of some forests to reduce the fire danger and enhance the re-establishment of aspen groves.
14. Illustrate the need for management and control of pinion-juniper forests to restore watershed,

wildlife habitat and forage values on rangelands.

15. Educate landowners on how to have timber harvested from their lands in a manner that increases their income while maintaining or enhancing the forest resource.

16. Provide information to landowners and users on grazing management of graze able woodlands.

17. Provide information on how to manage these areas to reduce or control the invasion of harmful insects and invasive weeds from public forests into their private forest lands.

18. Partner with and educate city foresters, green industry professionals, and citizens on health and management trees in urban settings.

19. Partner with and educate livestock producers and agency personnel on the identification and methods of control of the specific noxious and invasive species.

20. Educate developers, home owners, small acreage owners, outdoor recreationists, youth, and others interested in public lands on their critical role in preventing, reporting, and even helping to control these plants.

21. Emphasize the strategic elements of early detection and rapid response as outlined in the most recent National Invasive Species Management Plan.

2. Brief description of the target audience

The target audience includes the general public (including youth), users of various environments (agricultural producers, extractive industry representatives, environmentalists, recreationists, green industry professionals, etc.), small acreage owners, private forest owners, federal and state government officials, extension agricultural agents, and other academics and resource managers.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: {No Data}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	50	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of peer-reviewed journal articles and books/chapters in books extensively peer reviewed.

Year	Actual
2010	0

Output #2

Output Measure

- Level of contract/grant funding.

Year	Actual
2010	0

Output #3

Output Measure

- Number of graduate students or post-doctorate's trained.

Year	Actual
2010	0

Output #4

Output Measure

- Number of theses/dissertations completed.

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of program participants who gain knowledge on natural resource systems and the environment.
2	Number of program participants who implement positive natural resource systems and the environmental practices.

Outcome #1

1. Outcome Measures

Number of program participants who gain knowledge on natural resource systems and the environment.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	12000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
121	Management of Range Resources
122	Management and Control of Forest and Range Fires
123	Management and Sustainability of Forest Resources
125	Agroforestry
134	Outdoor Recreation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
141	Air Resource Protection and Management
605	Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Number of program participants who implement positive natural resource systems and the environmental practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6700	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
121	Management of Range Resources
122	Management and Control of Forest and Range Fires
123	Management and Sustainability of Forest Resources
125	Agroforestry
134	Outdoor Recreation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
141	Air Resource Protection and Management
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Production, Marketing, Trade, and International Economics

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management				
602	Business Management, Finance, and Taxation				
603	Market Economics				
604	Marketing and Distribution Practices				
605	Natural Resource and Environmental Economics				
606	International Trade and Development				
607	Consumer Economics				
608	Community Resource Planning and Development				
609	Economic Theory and Methods				
610	Domestic Policy Analysis				
611	Foreign Policy and Programs				
	Total				

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	1.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

Under the auspices of the experiment station, market tests will be conducted in order to determine the price premium associated with alternative production and marketing programs. Models will be built to quantify the impacts associated with international trade. Work will continue in the area of risk reduction for agricultural producers. Research and extension efforts will be needed to more thoroughly analyze the impacts of alternative, risk reducing strategies. Finally, firm-level analyses will continue so as to identify specific changes that might be made on individual farms and ranches that would enhance net returns.

Extension will outreach to agriculture businesses, small manufacturers, and entrepreneurs to provide educational training and in-depth information on:

- Small business management
- Home-based businesses
- Main street community programs
- Business retention and expansion
- Rural and heritage tourism
- Rural and economic development activities.
- E-commerce programs
- Community entrepreneurship programs
- Marketing (Market feasibility, research, customer relations/service, pricing)
- Finances (recordkeeping, raising capital, growing/expanding financial issues)
- Business plans for potential business owners
- Patents/trademarks/copyrights
- Insurance, zoning, and legal requirements
- Identifying business opportunities
- Developing a youth entrepreneurship program

2. Brief description of the target audience

The target audience for this planned program will include Utah communities, business owners, manufacturers, entrepreneurs, agricultural producers, agribusiness firms, state agencies, local governments, small acreage producers, policy makers, and the general public (including youth).

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: {No Data}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	5	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of peer-reviewed journal articles and books/chapters in books extensively peer reviewed.

Year	Actual
2010	0

Output #2

Output Measure

- Level of contract/grant funding.

Year	Actual
2010	0

Output #3

Output Measure

- Number of graduate students trained.

Year	Actual
2010	0

Output #4

Output Measure

- Number of theses/dissertations completed.

Year	Actual
2010	0

Output #5

Output Measure

- Training programs developed.

Year	Actual
2010	0

Output #6

Output Measure

- Trainings and conferences provided.

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clients who increase their knowledge of marketing trade, and economic development.
2	Number of clients who implement positive marketing, trade, and economic development practices.
3	A percentage (%) 12 month increase in manufacturing employment in Utah.
4	Number of clients who increase their knowledge of small business formation and operation.

Outcome #1

1. Outcome Measures

Number of clients who increase their knowledge of marketing trade, and economic development.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
606	International Trade and Development
607	Consumer Economics
608	Community Resource Planning and Development
609	Economic Theory and Methods
611	Foreign Policy and Programs

Outcome #2

1. Outcome Measures

Number of clients who implement positive marketing, trade, and economic development practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1700	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
606	International Trade and Development
607	Consumer Economics
608	Community Resource Planning and Development
609	Economic Theory and Methods
611	Foreign Policy and Programs

Outcome #3

1. Outcome Measures

A percentage (%) 12 month increase in manufacturing employment in Utah.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
606	International Trade and Development
607	Consumer Economics
608	Community Resource Planning and Development
609	Economic Theory and Methods

611 Foreign Policy and Programs

Outcome #4

1. Outcome Measures

Number of clients who increase their knowledge of small business formation and operation.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1300	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Individuals, Families, and Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
701	Nutrient Composition of Food				
702	Requirements and Function of Nutrients and Other Food Components				
703	Nutrition Education and Behavior				
704	Nutrition and Hunger in the Population				
721	Insects and Other Pests Affecting Humans				
723	Hazards to Human Health and Safety				
724	Healthy Lifestyle				
801	Individual and Family Resource Management				
802	Human Development and Family Well-Being				
803	Sociological and Technological Change Affecting Individuals, Families, and Communities				
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures				
805	Community Institutions, Health, and Social Services				
806	Youth Development				
	Total				

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	56.0	0.0	1.6	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

The faculty affiliated with the experiment station will:

1. Conduct research with respect to human nutrition, family finances, bankruptcy, and community development.

2. Publish studies and make presentations related to individuals, family finances, and community well-being.

Extension specialists and agents will conduct workshops and meetings, deliver activities, develop new curricula, write newsletters and news releases and post Internet fact sheets. They will provide training in a variety of mediums-face-to-face, satellite, group discussions, demonstrations, conferences and workshops, via DVDs, CDs, fact sheets, newsletters, and other media.

Individual and family financial activities will include: Take Charge of Your Money, Power Pay and Power Saves, Utah Saves Education and Outreach, Individual Development Account, First Time Homebuyer Assistance, Financial Education for Bankruptcy Filers (USU is certified by the Department of Justice to offer debtor education classes), Living Well on Less, Money Sense for Your Children, and Earned Income Credit assistance.

Teaching methods of The Utah Food Stamp Nutrition Education include individual, group classes, DVD video series, and an on-line course. FSNE Nutrition Education Assistants will provide other nutrition education opportunities to FSNE participants via demonstrations, newsletters, fact sheets, etc. as determined by Food Stamp Eligible needs in each county. Additionally, printed materials and educational displays will be available at local employment centers and other places where low-income people gather. Several counties will continue conducting cooking schools in cooperation with the local employment center; some will continue distribution of newsletters to participants.

The Nutrition Education Assistants will use the "Give Your Body the Best" curriculum developed in 2005 by USU to teach individuals or groups of low income persons. They will also teach lessons on chronic diseases; on food allergies, intolerance, and poisoning; and lessons on getting to know foods and enjoy them.

Community development specialists and extension personnel who are knowledgeable in community assessment will increase the capacity among other extension personnel to participate in or lead community self-assessments that lay the groundwork for subsequent project activities. These assessments come in various forms (SWOT analyses, asset mapping, search conferencing, surveys, etc.) and typically participatory, drawing upon the values and knowledge of local residents. They will also develop capacity in extension personnel to conduct activities identified as priorities through the community self-assessments. Leadership development curricula will be developed and offered.

2. Brief description of the target audience

The target group is the general population of Utah (including youth), with a special emphasis on Native Americans, Latinos, African Americans, Asians/Pacific Islanders, and low income families with children at or below poverty levels, food stamp program eligible individuals, and individuals facing bankruptcy. A subgroup of the audience targets is pregnant teens and teen mothers.

Elected officials, appointed officials, general population (including youth), and at-large community opinion leaders and influential people are targeted for community development.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: {No Data}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	15	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of peer-reviewed journal articles and books extensively peer reviewed.

Year	Actual
2010	0

Output #2

Output Measure

- Level of contract/grant funding.

Year	Actual
2010	0

Output #3

Output Measure

- Number of graduate students trained.

Year	Actual
2010	0

Output #4

Output Measure

- Number of theses/dissertations completed.

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clientele who gain knowledge about healthy and financially secure individuals, families, or communities.
2	Number of clientele who implement practices for healthy and financially secure individuals, families, or communities.
3	Percentage of Adults Who Reported Seven or More Days Physical Health NOT Good in the Past 30 Days.

Outcome #1

1. Outcome Measures

Number of clientele who gain knowledge about healthy and financially secure individuals, families, or communities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	178000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #2

1. Outcome Measures

Number of clientele who implement practices for healthy and financially secure individuals, families, or communities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	55000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #3

1. Outcome Measures

Percentage of Adults Who Reported Seven or More Days Physical Health NOT Good in the Past 30 Days.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	16	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Food Safety - Food Production and Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
303	Genetic Improvement of Animals	0%		10%	
311	Animal Diseases	0%		10%	
501	New and Improved Food Processing Technologies	0%		10%	
502	New and Improved Food Products	0%		15%	
504	Home and Commercial Food Service	23%		0%	
701	Nutrient Composition of Food	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	0%		15%	
704	Nutrition and Hunger in the Population	0%		10%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		10%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	77%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	6.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
30646	0	248768	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
30646	0	248768	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The experiment station:

1. Conducted experiments and develop theories that can be used to develop a safer food supply from production, through processing, and to the final consumer.
2. Conducted experiments and develop theories that can be used to develop new food products or improve existing food products.
3. Published studies and make presentations related to these two areas of concern.

Extension outreached to Utah residents, family consumer scientist agents, small and medium sized food processors, restaurant food safety managers to provide educational training and in-depth information on:

1. Safe food handling practices
2. Safe food preservation and storage practices
3. Certification to food safety managers
4. Safe food handling practices for processors
5. 4-H nutrition and health safety curricula and programs

2. Brief description of the target audience

The target audience included food processors, agricultural producers, general consumers (both within and without Utah), family consumer science agents, at risk groups and their families, 4-H youth, and other scientists.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3629	43082	1468	17427

2. Number of Patent Applications Submitted (Standard Research Output)
Patent Applications Submitted

Year: 2010
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	18	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of peer-reviewed journal articles and books/chapters in books extensively peer reviewed

Year	Actual
2010	18

Output #2

Output Measure

- Level of contract/grant funding

Year	Actual
2010	478000

Output #3

Output Measure

- Number of graduate students or post-doctorate's trained

Year	Actual
2010	13

Output #4

Output Measure

- Number of theses/dissertations completed

Year	Actual
2010	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clients who increase their knowledge of production and safety of food products.
2	Number of clients who implement positive food safety practices.
3	Number of cases per 100,000 population of food borne illness in Utah less than the 2005 UIBI-PH indicators for campylobacteriosis (expressed as percentage of population).
4	Number of cases per 100,000 population of food borne illness in Utah less than the 2005 UIBI-PH indicators for E. Coli (expressed as percent of population).
5	Number of cases per 100,000 population of food borne illness in Utah less than the 2005 UIBI-PH indicators for salmonella (expressed as percentage of population).
6	Number of clientele who gain knowledge about home and commercial food service
7	Number of clientele who implement home and commercial food service practices.

Outcome #1

1. Outcome Measures

Number of clients who increase their knowledge of production and safety of food products.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of clients who implement positive food safety practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2100	4964

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

With the tradition and culture in Utah, many people preserve food in the home, and use old family recipes that have not been approved by the USDA and are potentially unsafe. Also, many Utahns have a large supply of stored nutritious food that may never be used mostly due to lack of knowledge of how to incorporate it into day-to-day meals. The solutions to these problems include educating individuals on how to better improve their own and their family's safety in preserving food in the home as well as ways to use food storage ingredients. Pressure canning gauges need to be tested to insure canned goods are processed accurately.

What has been done

USU Extension offices give presentations, answers phone calls and perform pressure canning gauge testing services on how to safely preserve food in homes. This information, if followed accurately, will minimize and prevent food-borne illnesses that can endanger those who consume the food. Canning workshops taught safety tips and procedures for home preservation. In one county a total of 431 gauges were tested. Forty percent, or 175 of the gauges needed no adjustment. Fifty-five percent, or 238 needed slight adjustments and five percent, or 18 gauges needed to be replaced because of serious malfunctions. At another county USU Extension office 122 pressure canning gauges were tested for accuracy. Of these gauges, sixteen (13%) needed

to be replaced because they were no longer accurate.

Results

Home food preservation is safer for the 4,964 people who implemented food safety practices by having their gauges checked and attending Extension and Agricultural Experiment Station programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Number of cases per 100,000 population of food borne illness in Utah less than the 2005 UIBI-PH indicators for campylobacteriosis (expressed as percentage of population).

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of cases per 100,000 population of food borne illness in Utah less than the 2005 UIBI-PH indicators for E. Coli (expressed as percent of population).

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of cases per 100,000 population of food borne illness in Utah less than the 2005 UIBI-PH indicators for salmonella (expressed as percentage of population).

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of clientele who gain knowledge about home and commercial food service

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Number of clientele who implement home and commercial food service practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	191

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There are a growing number of small food businesses in Utah. These food entrepreneurs have many resources available related to business management, but very little information is available regarding food businesses specifically. Programming is needed to assist these entrepreneurs in understanding issues such as State and Federal regulations, production techniques and scale-up, and appropriate packaging.

What has been done

USU Extension obtained food establishment certification through the Utah Department of Agriculture and Food for one of the teaching kitchens in the Family Life building. The Incubator Kitchen is available for small businesses in the first stages of start-up.

Results

To date, four Cache Valley start-up companies have logged over 100 hours of use of the Incubator Kitchen. This has allowed them to forgo the process of certifying their home kitchens

under the Utah Cottage Food Act, and provided them with a work environment they feel more comfortable in (as opposed to a large commercial kitchen). Additionally, these companies are not required to put "Home Produced" on their food label, and has allowed them to expand their online sales to customers outside the state.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
311	Animal Diseases
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
504	Home and Commercial Food Service
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
704	Nutrition and Hunger in the Population
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Global Food Security and Hunger

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	0%		5%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		10%	
202	Plant Genetic Resources	0%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		5%	
205	Plant Management Systems	56%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	3%		5%	
213	Weeds Affecting Plants	1%		5%	
215	Biological Control of Pests Affecting Plants	0%		5%	
216	Integrated Pest Management Systems	3%		5%	
301	Reproductive Performance of Animals	0%		10%	
302	Nutrient Utilization in Animals	5%		5%	
304	Animal Genome	0%		10%	
307	Animal Management Systems	32%		10%	
603	Market Economics	0%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	27.0	0.0	23.4	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
413705	0	1076061	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
413705	0	1076261	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. Conducted research experiments with livestock and plants and plant material.
2. Published studies and make presentations related to plant propagation and livestock reproduction and actual plant and livestock production.
3. Conducted workshops and meetings to educate local, state, and regional stakeholders concerning progress in producing livestock and plants that are economically viable and environmentally friendly.
4. Provided new methods of livestock pest control and disease prevention.
5. Released new plant varieties relative to this program area under plant variety protection (PVP) status.
6. Expanded use of Integrated Pest Management (IPM).
7. Provided pest diagnostic assistance and management information to county agents, state and federal partners, commercial agriculture and horticulture producers, and the general public through the Utah Plant Pest Diagnostic Laboratory.
8. Coordinated efforts with other states and the Western Region Pest Management Center (WRPMC).
9. Enhanced the USU Master and 4-H Junior Master Gardener Programs.
10. Utilized multiple demonstrations/applied research plots to manage weeds in agronomic crops with results reported at field days, workshops, or annual meetings.
11. Conducted research experiments and develop theories that can be used to enhance plant and animal productive efficiencies through the use of genomics.
12. Published studies related to these areas of concern.
13. Conducted workshops and meetings for other scientists involved in this area of research.
14. Developed applications for the research on plant and animal genomics to directly benefit producers, youths, and other scientists.
15. Conducted market tests to determine the price premium associated with alternative production and marketing programs.
16. Built models to quantify the impacts associated with international trade.
17. Developed risk reduction models for agricultural producers.
18. Analyzed firm-level decisions to identify specific changes that might be made on individual farms and ranches that would enhance net returns.
19. Provided outreach to agriculture businesses, small manufacturers, and entrepreneurs to provide educational training and in-depth information on: small business management, home-based businesses, main street community programs, business retention and expansion, rural and heritage tourism, rural and economic development activities, E-commerce programs, community entrepreneurship, marketing (market feasibility, research, customer relations/service, pricing), finances (recordkeeping, raising capital, growing/expanding financial issues), business plans for potential business owners,

patents/trademarks/copyrights, insurance, zoning, and legal requirements, identification of business opportunities, and youth entrepreneurship programs.

2. Brief description of the target audience

The target audience for this work was other scientists, agricultural producers, landscapers, general public, home owners, green industry officials, professional landscape managers, turfgrass sod producers, local and regional livestock (primarily beef, dairy and equine) producers, small acreage owners, veterinarians, USDA, other private businesses, and government entities that conduct work in this area.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	76805	2386334	20170	626682

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	80	80

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contract/Grant Funds Generated

Year	Actual
2010	1200000

Output #2

Output Measure

- Number of Graduate Students/Post Docs Trained

Year	Actual
2010	35

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clientele who gain knowledge about improved human, plant, and animal management systems.
2	Number of clientele who implement improved human, plant, and animal management systems

Outcome #1

1. Outcome Measures

Number of clientele who gain knowledge about improved human, plant, and animal management systems.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	105978

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agriculture plays a significant role in the economy of Iron County. Crop programs need to emphasize water conservation and evaluating non-traditional crops that can be grown to diversify agricultural operations. Livestock programs need to focus on feed costs which make up approximately 60% of the production costs of sheep and cattle operations. Lowering the costs associated with feeding could significantly improve profitability; offer increased flexibility and lower dependence on public lands for sheep and beef producers in Iron County. In order to do this forage production on the farm or ranch must be maximized. New varieties of grasses, Alfalfa and other legumes have the potential to do this. However, their productivity and management under conditions that exist in the southwestern Utah need to be tested. Cultural practices and weed control that improve production in existing fields and pastures need to be implemented to obtain maximum productivity.

What has been done

The 2010 Crop and Water School was organized by USU Extension and Utah Agricultural Experiment Station. There were 71 ranchers who participated. Evaluations, representing 26,933 acres of alfalfa and 6,220 acres of pasture, were completed by half the participants. All 35 evaluation showed that hay production information from USU Extension was rated by participants as extremely valuable while 15 participants rated it as some what valuable.

Results

Forty-seven participants estimated the effect of implementing the information received from USU Extension on their Alfalfa hay profits as a 5 to 15% increase.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
307	Animal Management Systems
603	Market Economics

Outcome #2

1. Outcome Measures

Number of clientele who implement improved human, plant, and animal management systems

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	56810

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The future of the livestock, i.e. sheep, beef and dairy, in Summit County is facing an uphill challenge due to increased production costs, decreased commodity prices, environmental issues, development pressures and young people not taking over the family farm or ranch. Over the past few years, commodity prices have stayed the same or increased very little while the cost of producing the commodity has nearly doubled. Land prices have tripled during the past 10 years and the amount of farmland has decreased due to population growth during the same time period.

What has been done

With an organized educational program, producers learn the latest information/techniques in herd health, marketing, record keeping, nutrition and other areas of livestock production management. This program aids livestock producers to become more efficient and increase their net return. This past year a group of individuals and government officials formed a committee called the "Summit County Food Coalition" The Summit County Food Coalition organized a program where local raised grass feed beef was sold to local grocery stores, restaurants and individuals in Park City. This group obtained a \$25,000 grant/no interest loan from Summit County to promote this program.

Results

Local ranchers involved with this program received \$140.00 per head more for their calves (26 head) compared to their traditional market. The coalition hopes this will become a viable market outlet for the ranchers in Summit County. Their goal is to help any Summit County food producer become more sustainable in the county.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
304	Animal Genome
307	Animal Management Systems
603	Market Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

There have been so many factors that have influenced our ability to follow through on the goals that were set. We have received a reduction in budget from state sources. County-level budgets have also been dramatically impacted. The southern portion of the state experienced a severe drought, a continuation of the past several years. Competing public priorities have further reduced budgets to CES and UAES. The composition of the state's population continues to change, with a higher immigration and in-migration of individuals outside the goal and program areas established in previous years. These and other factors have combined to reduce the effectiveness of goal attainment, though all goals were achieved to some extent.

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

Numerous methods of evaluation will be used as noted above. In addition to the overall "before-after" evaluation, the program will be evaluated as we work through the program. Time series studies are particularly helpful when evaluating changes under this planned program and time series data will be collected to verify how effective this planned program is. Case studies will be utilized where appropriate (particularly with innovators), and comparisons will be made between the participants and those not participating where appropriate. There are some obvious limitations to this approach given that most of what we observe is not within a controlled environment, but is the result of some people adopting practices while others may not. The bench sciences are able to conduct studies with and without treatments, whereas the social sciences must look at adoptors versus nonadoptors in a different light (self-selecting bias).

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	2%		5%	
112	Watershed Protection and Management	6%		10%	
121	Management of Range Resources	3%		10%	
123	Management and Sustainability of Forest Resources	0%		10%	
132	Weather and Climate	0%		15%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		10%	
205	Plant Management Systems	87%		10%	
213	Weeds Affecting Plants	0%		10%	
307	Animal Management Systems	0%		10%	
605	Natural Resource and Environmental Economics	2%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	13.0	0.0	23.7	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
199191	0	596821	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
199191	0	526821	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. Continued to facilitate and assist the establishment and success of local Conservation Resource Management (CRM) groups, for more local control of decisions on natural resources.
2. Educated the public with respect to the principle causes of air pollution and their role in prevention.
3. Partnered with others to enable agriculture producers to meet the requirements of the EPA.
4. Established herbicide demonstration/research plots to evaluate the efficacy of these products under local conditions.
5. Conducted projects consultations, and workshops focusing on the role of outdoor recreation and natural resource-based tourism in relation to community development.
6. Partnered with others in education and use of resources to rehabilitate the sagebrush steppe environment.
7. Educated and partner to enable the recovery of the sage grouse, pygmy rabbit and others to avoid listing as endangered species.
8. Determined management options that slow or stop the cycle of cheatgrass and fire on previously burned areas through range rehabilitation, seeding programs and nontraditional approaches to grazing management.
9. Educated producers and agency personnel on the need for continued range evaluation, monitoring, and management improvements and the role of grazing management in sustainable resource management.
10. Educated the public on responsible use and the value of multiple uses on rangelands.
11. Illustrated the need for management and control of pinion-juniper forests to restore watershed, wildlife habitat and forage values on rangelands.
12. Educated the public regarding various options with respect to adapting to global climate change
13. Provided information to landowners and users on grazing management of grazeable lands.
14. Partnered with and educate the general public, livestock producers and agency personnel on the identification and methods of control of the specific noxious and invasive species.
15. Conducted experiments and develop theories that can be used to enhance water, soil, wildlife, and for various agronomic and urban areas.
16. Published studies relating to this program area.
17. Provided educational training, problem solving, and in-depth applied information to: facilitate rehabilitation of degraded watersheds, protect and manage watersheds, conserving, managing and enhancing efficient water use, derive efficient irrigation strategies and technologies, implement water-wise landscaping practices, evaluate and promote plants that require less water and are drought tolerant, preserve and enhance water quality, enhance quality, capture, and use of storm-water and gray-water, identify areas of current or potential soil loss or reduced soil fertility and partner with other agencies to

reduce and control these problems, educate producers on the important interactions of soil and irrigation, provide information on soil nutrient deficiencies and cost effective soil quality and fertility improvements, continue demonstration projects and salinity, soil types, non-traditional soil fertility amendments, fertilizer formulation efficacy, organic matter use and management.

2. Brief description of the target audience

The target audience includes the general public, users of various environments (agricultural producers, extractive industry representatives, environmentalists, green industry professionals, etc.), small acreage owners, private forest owners, extension agriculture and horticulture agents, federal and state water and soil management agencies, and other academics and resource managers.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	42102	564834	11433	153383

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	80	80

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Graduate Students/Post Docs Trained

Year	Actual
2010	23

Output #2

Output Measure

- Contract/Grant Dollars Generated

Year	Actual
2010	2325000

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clientele who gain knowledge about improved human, plant, and animal management systems that relate to climate change and/or natural resource use.
2	Number of clientele who implement improved human, plant, and animal management systems as related to climate change and/or natural resource use.

Outcome #1

1. Outcome Measures

Number of clientele who gain knowledge about improved human, plant, and animal management systems that relate to climate change and/or natural resource use.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	92079

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Climate Change is a critical issue given the semi-arid state of the region. It is necessary to conduct research and disseminate that information to private and public entities so that they can be prepared and make whatever adjustments they can in the face of these changes.

What has been done

Science-based research must be undertaken to determine the exact nature of and timing of changes to our climate. This is too important of an issue to be left to uninformed debate and policy measures. That research then needs to be transferred to public and private entities so that needed adjustments can be made in businesses and with individuals potentially impacted by this issue.

Results

Individuals, businesses, and governments will adapt to the changes and challenges introduced by climate change.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
132	Weather and Climate

201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems
213	Weeds Affecting Plants
307	Animal Management Systems
605	Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Number of clientele who implement improved human, plant, and animal management systems as related to climate change and/or natural resource use.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	54333

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Climate Change is a critical issue given the semi-arid state of the region. It is necessary to conduct research and disseminate that information to private and public entities so that they can be prepared and make whatever adjustments they can in the face of these changes.

What has been done

Science-based research must be undertaken to determine the exact nature of and timing of changes to our climate. This is too important of an issue to be left to uninformed debate and policy measures. That research then needs to be transferred to public and private entities so that needed adjustments can be made in businesses and with individuals potentially impacted by this issue.

Results

Individuals, businesses, and governments will adapt to the changes and challenges introduced by climate change.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
132	Weather and Climate
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems
213	Weeds Affecting Plants
307	Animal Management Systems
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

There have been so many factors that have influenced our ability to follow through on the goals that were set. We have received a reduction in budget from state sources. County-level budgets have also been dramatically impacted. The southern portion of the state experienced a severe drought, a continuation of the past several years. Competing public priorities have further reduced budgets to CES and UAES. The composition of the state's population continues to change, with a higher immigration and in-migration of individuals outside the goal and program areas established in previous years. These and other factors have combined to reduce the effectiveness of goal attainment, though all goals were achieved to some extent.

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Sustainable Energy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
206	Basic Plant Biology	0%		50%	
402	Engineering Systems and Equipment	0%		25%	
403	Waste Disposal, Recycling, and Reuse	100%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	1.0	0.0	1.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
15322	0	55839	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
15322	0	55839	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. Conducted research into alternative biofuels and methods of production that are well-suited for the Intermountain West.

- 2. Publish in peer-reviewed journals and other professional outlets.
- 3. Take the research that is done and adapt that research so useful practical strategies might be followed in producer biofuels to the extent that it can be shown to be beneficial in terms of benefits and costs.

2. Brief description of the target audience

For experiment station faculty their target audiences are geared primarily towards extension specialists, county agents, and other scientists; the specialists' audiences include peers, county agents, federal and state organizations, producer groups, state and local government, and the general public. County agents work cooperatively with federal, state, and local governments, citizen groups, and the public to address sustainable energy issues in their areas.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	280	675	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	10	10

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Graduate Students/Post Docs Trained

Year	Actual
2010	0

Output #2

Output Measure

- Contract/Grant Dollars Generated

Year	Actual
2010	50000

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clientele gaining sustainable energy knowledge
2	Number of clientele who implement sustainable energy practices

Outcome #1

1. Outcome Measures

Number of clientele gaining sustainable energy knowledge

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	353

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The U.S. and rest of the world have relied on nonrenewable energy sources for over a century. There is a general consensus that the current pace of energy consumption can continue to rely on traditional energy sources for only so long, then it will be necessary to shift to an alternative source of energy. Besides the energy supply issue, many are concerned about the effects of current energy sources and uses on the earth's environments including ground, water, and air contamination. Finally, there is an increasing concern about whether the U.S. can become energy independent, essentially relying on renewable energy sources of all types.

What has been done

USU Extension and Agricultural Experiment Station converted a failed project implementing induced blanket reactor (IBR) technology to a successfully operating system. The manure digester is a renewable, alternative energy project that is capable of producing 48kW/hr of 'green' electricity. The digester produces bio-gas containing 66% methane. The digester system cost about \$875,000 to construct and modify. Effluent heat exchanger provides a 5 degree F increase in manure temperature at an 8.3 gal/min in feed rate.

Results

Since commissioning in June 2009 the engine generator set has produced 180mW of electricity. The dairy operating the manure digester is being paid \$.032/kW or \$5760 to date. The electricity to consumers in Utah is valued at \$13,500 (\$.075). The same amount of electricity is valued at \$32,400 (\$.18) in 'green' markets such as California when considered as being produced from a renewable energy source.

4. Associated Knowledge Areas

KA Code	Knowledge Area
206	Basic Plant Biology
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse

Outcome #2

1. Outcome Measures

Number of clientele who implement sustainable energy practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	263

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The U.S. and rest of the world have relied on nonrenewable energy sources for over a century. There is a general consensus that the current pace of energy consumption can continue to rely on traditional energy sources for only so long, then it will be necessary to shift to an alternative source of energy. Besides the energy supply issue, many are concerned about the effects of current energy sources and uses on the earth's environments including ground, water, and air contamination. Finally, there is an increasing concern about whether the U.S. can become energy independent, essentially relying on renewable energy sources of all types.

What has been done

USU Extension converted a failed project implementing induced blanket reactor (IBR) technology to a successfully operating system. The manure digester is a renewable, alternative energy project that is capable of producing 48kW/hr of 'green' electricity. The digester produces bio-gas containing 66% methane. The digester system cost about \$875,000 to construct and modify. Effluent heat exchanger provides a 5 degree F increase in manure temperature at an 8.3 gal/min in feed rate.

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to consumers in Utah is valued at \$13,500 (\$.075). The same amount of electricity is valued at \$32,400 (\$.18) in 'green' markets such as California when considered as being produced from a renewable energy source.

4. Associated Knowledge Areas

KA Code	Knowledge Area
206	Basic Plant Biology
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

There have been so many factors that have influenced our ability to follow through on the goals that were set. We have received a reduction in budget from state sources. County-level budgets have also been dramatically impacted. The southern portion of the state experienced a severe drought, a continuation of the past several years. Competing public priorities have further reduced budgets to CES and UAES. The composition of the state's population continues to change, with a higher immigration and in-migration of individuals outside the goal and program areas established in previous years. These and other factors have combined to reduce the effectiveness of goal attainment, though all goals were achieved to some extent.

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 13

1. Name of the Planned Program

Childhood Obesity, Nutrition, and Community

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	8%		20%	
702	Requirements and Function of Nutrients and Other Food Components	0%		20%	
703	Nutrition Education and Behavior	32%		20%	
724	Healthy Lifestyle	1%		0%	
801	Individual and Family Resource Management	42%		15%	
802	Human Development and Family Well-Being	9%		10%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	8%		10%	
806	Youth Development	0%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	66.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1011279	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1011279	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. Conducted research with respect to human nutrition, family finances, bankruptcy, and community development.

2. Published studies and made presentations related to individuals, family finances, and community well-being.

3. Conducted workshops and meetings, activities, developed new curricula, wrote newsletters and news releases and posted Internet fact sheets.

4. Provided training in a variety of mediums including face-to-face, satellite, group discussions, demonstrations, conferences and workshops, via DVDs, CDs, fact sheets, newsletters, and other media.

5. Included the following materials or media sources in training sessions: Take Charge of Your Money, Power Pay and Power Saves, Utah Saves Education and Outreach, Individual Development Account, First Time Homebuyer Assistance, Financial Education for Bankruptcy Filers (USU is certified by the Department of Justice to offer debtor education classes), Living Well on Less, Money Sense for Your Children, and Earned Income Credit assistance.

6. Utilized different teaching methods of The Utah Food Stamp Nutrition Education including individual, group classes, DVD video series, and an on-line course. FSNE Nutrition Education Assistants provided other nutrition education opportunities to FSNE participants

7. Used the "Give Your Body the Best" curriculum developed in 2005 by USU to teach individuals or groups of low income persons regarding chronic diseases; on food allergies, intolerance, and poisoning; and lessons on getting to know foods and enjoy them.

8. Increase the capacity among other extension personnel to participate in or lead community self-assessments (SWOT analyses, asset mapping, search conferencing, surveys, etc.) that lay the groundwork for subsequent project activities.

9. Conducted research experiments and/or develop theories that can be used to explain (a) causes for public land conflicts and potential solutions, (b) solutions to the urban expansion into rural areas and open space, and (c) conditions for continued rural community economic viability.

10. Published studies and make presentations related to these areas of concern.

11. Conducted workshops and meetings to educate local, state, and regional stakeholders concerning these issues.

12. Delivered educational and informational services through various media.

13. Developed educational resources related to rural economic viability for community leaders and other stakeholders

14. Provided for local training in principles developed that are related to this area of study.

15. Conduct design activities (for a park, a Main Street revitalization, etc.) that will typically yield a design of variable specificity (some might be conceptual drawings, others might be more extensive).

16. Provided consultations regarding land use planning policies and their implications on growth.

2. Brief description of the target audience

The target group was the general population of Utah (including youth), with a special emphasis on Native Americans, Latinos, African Americans, Asians/Pacific Islanders, and low income families with children at or below poverty levels, food stamp program eligible individuals, and individuals facing bankruptcy. A subgroup of the audience targets is pregnant teens and teen mothers.

Elected officials, appointed officials, general population (including youth), and at-large community opinion leaders and influential people are targeted for community development.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	246398	1521669	335624	2072697

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Graduate Students/Post Docs Trained

Year	Actual
2010	0

Output #2

Output Measure

- Contract/Grant Dollars Generated

Year	Actual
2010	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clientele who gain knowledge about nutrition education and behavior.
2	Number of clientele who implement practices of nutrition education and behavior.
3	Number of clientele who gain knowledge about individual and family resource management.
4	Number of clientele who implement individual and family resource management.

Outcome #1

1. Outcome Measures

Number of clientele who gain knowledge about nutrition education and behavior.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	86120

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #2

1. Outcome Measures

Number of clientele who implement practices of nutrition education and behavior.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	27758

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There has been a crises of nutrition in the U.S. even though there have also been large food surpluses. There is a need to provide much 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 the USDA Supplemental Nutrition Assistance Program (SNAP). More work is needed to allow all people in the U.S. the opportunity share in the abundance of food items.

What has been done

USU Extension and Utah Agricultural Experiment Station conducted research with respect to human nutrition. They held workshops and meetings, developed curricula, wrote newsletters and news releases and posted internet fact sheets pertaining to nutrition. USU's Food Sense program utilized different teaching methods including individual, group classes, DVD video series, and an on-line course to teach participants. Supplemental Nutrition Assistance Program (SNAP) assistants provided other nutrition education opportunities to SNAP participants. They also used the "Give Your Body the Best" curriculum developed in 2005 by USU to teach individuals or groups of low income persons regarding chronic diseases; on food allergies, intolerance, and poisoning; and lessons on getting to know foods and enjoy them. In 2010 there were 11,398 adults and 16,386 youth for a total of 27,784 people enrolled in USU Food Sense programs.

Results

After participating in 4 or more lessons participants complete the Post/Pre Evaluation. Twenty behaviors with significant improvements were 1) planned meals ahead of time, 2) compared prices when shopping, 3) enough food until the end of the month, 4) grocery shop with a list, 5)

refrigerate meat and dairy within 2 hours of shopping, 6) thaw foods properly - do not thaw frozen foods at room temperatures, 7) make food purchases based on healthy choices, 8) prepare foods without adding salt, 9) read Nutrition Facts Labels before purchasing, 10) children in household eat something within 2 hours of waking, 11) wash hands before food preparation or eating, 12) prepare raw foods separately from other foods, 13) choose to be physically active, at least 30 minutes 5 days a week, 14) choose to walk, take the stairs, or be active in other ways, 15) prepare meals at home at least 3 times a week, 16) eat meals together as a family at least 3 times a week, 17) eat at least 3 servings of vegetables a day, 18) eat at least 2 servings of fruit a day, 19) eat at least 2 servings of dairy a day, 20) replace saturated and transfat with heart healthy fat.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #3

1. Outcome Measures

Number of clientele who gain knowledge about individual and family resource management.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	22661

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #4

1. Outcome Measures

Number of clientele who implement individual and family resource management.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	13390

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is an increasing gap between income and the cost of basic needs (housing, transportation, energy, education, etc) in this country, and with Utahns historically low income this gap is a huge concern amongst educators and the charitable sector. Currently, one-third of all Utahns live at or below 200% of the federal poverty line (which is defined as unable to meet the basic needs in life). Real median income in the United States was lower in 2005 than it was in 1999, and nearly a quarter of all workers in the U.S. are earning below poverty level wages. As wages and

household income for middle and lower income households has declined or remained relatively flat, costs for certain basic needs have increased at rates far exceeding typical inflation.

What has been done

Utah Individual Development Account Network (UIDAN)

This national program was originally brought to Utah by Utah Issues and is currently housed with AAA Fair Credit Foundation. USU fostered a partnership with Utah Issues, AAA Fair Credit, and others to have USU Utah Individual Development Account Network (UIDAN)

Extension as the financial educators of this program. Eighteen FCS Agents teach an eight to ten hour basic financial course for UIDAN applicants. This financial course is taught to low-income, working adults who qualify into this national program to build wealth. The individual saves money towards a home, a secondary education or a small business and their money is matched 3 to 1.

Results

Over 3,500 people have completed Extension's financial course around the state. Five years after starting the program, there are 37 people in homes (over \$6.2 million in mortgages), 59 have invested over \$205,000 in post secondary education at 19 schools, and 13 have started or capitalized a small business with over \$68,000.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

There have been so many factors that have influenced our ability to follow through on the goals that were set. We have received a reduction in budget from state

sources. County-level budgets have also been dramatically impacted. The southern portion of the state experienced a severe drought, a continuation of the past several years. Competing public priorities have further reduced budgets to CES and UAES. The composition of the state's population continues to change, with a higher immigration and in-migration of individuals outside the goal and program areas established in previous years. These and other factors have combined to reduce the effectiveness of goal attainment, though all goals were achieved to some extent.

V(I). Planned Program (Evaluation Studies and Data Collection)

Evaluation Results

Key Items of Evaluation