Utah FY 2000
Report of Accomplishments and Results

March 2001

Utah State University Experiment Station
Utah State University Extension

A. PROGRAMS

Goal 1 - An agricultural system that is highly competitive in the global economy.

Overview

Successes under Goal 1 include the following:

Hay samples collected from livestock operations that feed horses, dairy cows and beef cattle were analyzed using NIRS analysis at Utah State University. Analysis results were used to balance feed rations for these livestock producers. One dairy operation increased milk production by 8 pounds per cow per day as a result of the hay analysis. Hay producers were able to market their hay at a higher price after the feed value had been measured. One producer sold 100 tons of hay for $15/ton more after the quality analysis was completed. Another producer increased the value of 150 tons of hay by $10/ton when the hay tested 21% crude protein.

USU Extension specialists and county agents conducted educational programs dealing with the Dairy Option Pilot Program. This program was offered by USDA to dairy farmers and allowed them to purchase options at a subsidized rate. However, farmers had to attend an Extension meeting on these options before they could participate in the program. A group of farmers in one county improved their marketing proceeds by over $70,000.00 as a result of attending the Extension meeting. Participants in Extension programs report a 65% increase in knowledge about futures and options. One producer mentioned that he had saved $10,000.00 on his feed bill by using a futures contract.

In May 2000 there were several nights of extremely cold weather in parts of Utah. Wheat producers were concerned that their crop had been severely damaged by the frost and asked Utah State University Extension to help them decide whether to green chop the wheat and make silage or let it go to harvest. The county agent examined immature kernels from several locations in each suspect field and was able to determine under microscope evaluations that some fields had not been frozen. Three wheat farmers, who received advice from the county agent and did not chop their wheat, harvested 3,722 tons of wheat at the end of the season. The farmers had contracted their winter wheat with a future price that was $.95 more than the market price at harvest. These three farmers made $289,572.00 on wheat that they might have green chopped if they had not received appropriate advice from their Extension agent. In addition to this amount, they forward contracted the wheat based on Extension advice at a future's workshop and made an additional $70,718.00

Soil testing to determine fertilizer needs is not practiced on many Utah farms. During the past 3 years (1998-2000) Extension agents have educated local growers on the need to test for sulfur. There has been an increase in the number of soil samples tested for sulfate sulfur and 60% of the samples tested were deficient. From the results of a soil test one producer had a savings of $2000.00 because the test results showed that he did not need to apply the fertilizer rate he had planned to use. Another producer saved $3000.00 for the same reason. Extension specialists and county agents have shown that sulfur deficient soils have reduced alfalfa yields in some areas of Utah.

Varieties of crops grown throughout Utah do not always perform the same in all regions. As a result of farmers attending Extension crop workshops and receiving the agriculture newsletters, more farmers are planting recommended crop varieties. Although many factors are involved, use of improved varieties are part of the reason why some counties in Utah are reporting an increase in yield over the past 8 years of: 13% for grain corn; 21% for silage corn; 67% for spring wheat; and 10% for spring barley.

Although field crops remain important to Utah's agriculture, more and more producers are trying to diversify their operations by growing vegetable crops. Some of these producers have land that is free of diseases, insects, and weeds common to these new crops. One grower in Utah decided to produce 4 acres of pumpkins for different Utah markets. There was a powdery mildew problem in the middle of August and the grower received pest management help from USU Extension. The grower estimated that the pumpkins were worth about $5000/acre in direct market sales and the production costs were $2400/acre. Extension input on control of powdery mildew is estimated to have saved him $7,400.00 in product loss.

Another alternative to conventional agricultural production is the development of organic products. One farmer in Utah estimated that he grossed an extra $60,000.00 in 1999 by producing organic wheat instead of conventional wheat.

Onions seems to be one of the only real cash crops when there is a local market. A producer who wanted to diversify his agricultural production started to grow 40 acres of onions each year after receiving a suggestion from his county agent. He averages 1000 50 lb sacks/acre and is paid $40/sack. Gross return per acre is $4000.00 while costs are approximately $1000.00/acre. This is a substantial increase over the $200/acre he would normally get for alfalfa or corn. Over the 6-year period he has grossed about $720,000.00 on his 40 acres of onions.

State Assessment: The programs offered within Goal 1 address critical issues in Utah. Extension faculty on campus and in the counties are responding very well to local and state-wide needs. The impacts reported here reflect a very successful program of work. They also reflect the beginning of the five-year plan. We expect that we will need to change some of the goals and indicators set at the beginning of the five-year plan because of the dynamic nature of our economy, our population, and changes in our environment.

Total expenditures and FTE:

Smith-Lever $477,645
State Match $471,801
FTE 16.45

Utah Extension Service

Key Theme - Adding Value to New and Old

Agronomy Crop Production

Brief Description: Buying and selling forage crops based on a feed analysis is not a common practice in Utah. Hay samples collected from livestock operations that feed horses, dairy cows and beef cattle were analyzed for feed quality using NIRS analysis at Utah State University. Analysis results were used to balance feed rations for these livestock producers.

Impacts: One dairy operation increased milk production by 8 pounds per cow per day as a result of the hay analysis. Hay producers were able to market their hay at a higher price after the feed value had been measured. One producer sold 100 tons of hay for $15/ton more after the quality analysis was completed. Another producer increased the value of 150 tons of hay by $10/ton when the hay tested 21% crude protein. In general, hay-testing leads to a minimum 10% increase in price (average $90.00 per ton vs. $100/ ton) if hay can be shown to be of excellent quality.

Source of Funds: Smith Lever, State

Impacts: UT

Alternative Agriculture and Markets

Brief Description: USU Extension specialists and county agents conducted educational programs dealing with the Dairy Option Pilot Program. This program was offered by USDA to dairy farmers and allowed them to purchase options at a subsidized rate. However, farmers had to attend an Extension meeting on these options before they could participate in the program.

Impacts: A group of farmers in one county improved their marketing proceeds by over $70,000.00 as a result of attending the Extension meeting. Many farmers and ranchers are interested in learning more about futures and options that would give them an edge when selling their crops. Participants in Extension programs report a 65% increase in knowledge about futures and options. One producer mentioned that he had saved $10,000.00 on his feed bill by using a futures contract.

Source of Funds: Smith Lever, State

Impacts: UT

Gardening and Ornamental Horticulture

Brief Description: Many home owners grow fruit trees to provide fresh fruit for their families, for canning, and for their own enjoyment. Without proper pruning these trees become less productive and vigorous. In one county 110 home owners with 385 fruit trees learned to prune trees from an Extension demonstration class. The average cost of hiring a tree professionally pruned is $435/tree.

Impacts: The home owners saved $13,475.00 by learning to prune their own trees.

Brief Description: An added expense for many homeowners is the design of their landscape. A well designed landscape can add 30% to the value of a home. A three-week landscape design class was taught to help homeowners develop and design a basic landscape.

Impacts: Thirty individuals participated in the program and estimated that they saved over $33,000.00 by doing their own landscape design.

Source of Funds: Smith Lever, State

Impacts: UT

Key Theme - Agricultural Products

Agronomy Crop Production

Brief Description: In May 2000 there were several nights of extremely cold weather in parts of Utah. Wheat producers were concerned that their crop had been severely damaged by the frost and asked Utah State University Extension to help them decide whether to green chop the wheat and make silage or let it go to harvest. The county agent examined immature kernels from several locations in each suspect field and was able to determine under microscope evaluations that some fields had not been frozen.

Impacts: Three wheat farmers, who received advice from the county agent and did not chop their wheat, harvested 3,722 tons of wheat at the end of the season. The farmers had contracted their winter wheat with a future price that was $.95 more than the market price at harvest. These three farmers made $289,572.00 on wheat that they might have green chopped if they had not received appropriate advice from their Extension agent. In addition to this amount, they forward contracted the wheat based on Extension advice at a future's workshop and made an additional $70,718.00

Source of Funds: Smith Lever, State

Impacts: UT

Gardening and Ornamental Horticulture

Brief Description: Gardening and landscaping is considered a hobby and an important source of food for many people in Utah. It is estimated that more than 65% of the households in many counties in Utah have a garden. When people move to Utah from a milder climate they often select inappropriate ornamentals and vegetables. Gardening short courses are offered by USU Extension to provide appropriate garden/ornamental information.

Impacts: Homeowners attending gardening short courses rank them as a 9 (scale of 1 - 10 where 10 is best). Extension agents cannot meet the demand for garden questions and use the assistance of Master Gardeners to get the job done well. In one county alone 72 Master Gardeners volunteered approximately 2000 hours in one season, a value of $20,000.00. It is calculated that they contacted 11,000 people and answered their questions and discussed their concerns.

Source of Funds: Smith Lever, State

Impacts: UT

Key Theme - Agricultural Competitiveness

Agronomy Crop Production

Brief Description: Varieties of crops grown throughout Utah do no always perform the same in all regions. As a result of farmers attending Extension crop workshops and receiving the agriculture newsletters, more farmer are planting recommended crop varieties.

Impacts: In one county alfalfa production has increase by 0.75 tons/acre over what it was 6 years ago. In corn variety evaluations the top-yielding hybrid in the Utah State University demonstration plot in one county produced 3.34 tons/acre more than the average for all varieties. At a value of $27/ton for corn silage, planting the top yielding variety would return to the grower $90.18/acre more than growing the average variety. In this county there are 3,827 acres of corn silage (about 6% of the corn acreage in Utah). If all 3,827 acres had been planted to the top yielding variety from the USU test plot it could mean an additional production value of $345,188.00 for the county. Although many factors are involved, use of improved varieties are part of the reason why some counties in Utah are reporting an increase in yield over the past 8 years of: 13% for grain corn; 21% for silage corn; 67% for spring wheat; and 10% for spring barley.

Source of Funds: Smith Lever, State

Impacts: UT

Key Theme - Agricultural Profitability

Agronomy Crop Production

Brief Description: Soil testing to determine fertilizer needs is not practiced on many Utah farms. Demonstration samples have been collected from home gardens, golf courses, pasture range, and crop land. Producers gain experiences obtaining soil samples and learn to appreciate proper nutrient management to avoid environmental contamination. Most producers are finding that increased management will solve most of the environmental issues and that this knowledge may even save them money.

Impacts: From the results of a soil test one producer had a savings of $2000.00 because the test results showed that he did not need to apply the fertilizer rate he had planned to use. Another producer saved $3000.00 for the same reason. Extension specialists and county agents have shown that sulfur deficient soils have reduced alfalfa yields in some areas of Utah. During the past 3 years (1998-2000), the Extension agent has educated local growers on the need to test for sulfur. There was an increase in the number of soil samples tested for sulfate sulfur and 60% of the samples tested were deficient in sulfur. In a USU field trial alfalfa yield was increased by 0.24 tons/acre when sulfur was added to deficient soils. If alfalfa sells for $100/ton this amounts to extra production worth $24/acre. These educational efforts could result in an increased income of $12,245.00 in a single county from the use of sulfur fertilizer.

Source of Funds: Smith Lever, State

Impacts: UT

Key Theme -Diversified/Alternative Agriculture

Agronomy Crop Production

Brief Description: There is growing interest in irrigated pasture and intensive grazing in Utah. Pasture revitalization and renovation is an important part of some new forage production practices in Utah. Pasture management is an important component of forage production. In USU experimental plots fertilized grass produced 2.20 dry tons/acre while control plots only produced 1.06 dry ton/acre in a 38 day period. Grass is valued at $60/ ton and the cost of fertilizer is $48/acre. By applying the proper amount of fertilizer there would be a $2,397/year net gain on a 27 acre pasture. In another location in southern Utah top yielding grasses in a USU Extension plot produced 14,207 pounds of forage/acre while least productive species produced 8207 pounds/acre during the same period of time.

Impacts: Proper use of irrigation water, appropriate field tours and seminars have helped promote irrigated pasture as an important source of forage for Utah. In addition, Extension test plots throughout Utah have established the Utah State University Extension as a leader in pasture management, education, and production.

Source of Funds: Smith Lever, State

Impacts: UT

Alternative Agriculture and Markets

Brief Description: Although field crops remain important to Utah's agriculture, more and more producers are trying to diversify their operations by growing vegetable crops. Some of these producers have land that is free of diseases, insects, and weeds common to these new crops.

Impacts: One grower in Utah decided to produce 4 acres of pumpkins for different Utah markets. There was a powdery mildew problem in the middle of August and the grower received pest management help from USU Extension. The grower estimated that the pumpkins were worth about $5000/acre in direct market sales and the production costs were $2400/acre. Extension input on control of powdery mildew is estimated to have saved him $7,400.00 in product loss. Another alternative to conventional agricultural production is the development of organic products. One farmer in Utah estimated that he grossed an extra $60,000.00 in 1999 by producing organic wheat instead of conventional wheat. Forage turnips produced 1.6 pound/day of grain on steers when they were grazed in the early winter months. The cost per pound gained was estimated to be $0.58.

Source of Funds: Smith Lever, State

Impacts: UT

Sustainable Agriculture

Brief Description: Ag in the Classroom program introduces children in elementary school to a farm environment where they learn about the production of agricultural products.

Impacts: In one county over 1400 5th grade students visited a farm and learned about agriculture. Teachers are provided with the material they need in order to prepare the students for the farm visit and to take what they have learned back to the classroom.

Source of Funds: Smith-Lever, State

Impacts: UT

Key Theme - Agricultural Profitability

Horticulture - Commercial Fruit and Vegetable Production

Brief Description: Onions seems to be the only real cash crop when there is a local market. A producer who wanted to diversify his agricultural production has started to grow 40 acres of onions each year after receiving a suggestion from his county agent. He averages 1000 50 lb. sacks/acre and is paid $40/sack. A sweet corn producer had production problem in 2000. The county agent evaluated the situation and determined the problem to be drought.

Impacts: For onions, gross return per acre is $4000.00 while costs were approximately $1000.00/acre. This is a substantial increase over the 4200/acre he would normally get for alfalfa or corn. Over the 6-year period he has grossed about $720,000.00 on his 40 acres of onions. The corn producer followed the irrigation recommendation and saved several hundred dollars of sweet corn.

Source of Funding: Smith Lever, State

Scope of Impact: UT

Key Theme - Animal Production Efficiency

Sustainable Agriculture

Brief Description: County agents and Extension specialists balance animal feed rations to help farmers/rancher decide if they can make money feeding calves during the winter. Turkey production in Utah has traditionally been a seasonal business. However, winter turkey production has become possible and profitable.

Impacts: By analyzing market data it was possible to show a beef producer in one Utah County that he could make a good profit because of low feed prices. By adjusting the ration he could save 6 cents/steer/day that could save him $8760.00 on 400 head of steer. He was able to use this estimate to get a production loan to purchase the calves. With respect to turkeys, by manipulating the environment producers have been able to lower feed conversion rates by 0.4 - 0.5 lbs. of feed per lb. of gain in non-optimal growing times. This makes it possible to raise turkeys year round and have it be a profitable venture.

Source of Funds: Smith Lever, State

Scope of Impact: UT

Utah Agricultural Experiment Station:

The Utah Agricultural Experiment Station has a large number of projects in this goal area and we will continue to maintain those individual projects, but the research effort is very diverse. Thus, we cannot identify a clear “program” for this POW. The specific projects do address various issues related to production, processing, and marketing.

" \l 3Goal 2: A safe and secure food and fiber system.

" \l 3Overview

Successes under Goal 2 include the following:

Food poisoning from public food establishments had been on the rise in Utah in recent years; however, according to state statistics, the rate of food poisoning is on the decline because of mandatory training and mandatory certification. Utah State University's teamwork with the Utah State Department of Health offered USU's Food Safety Managers Certification Course statewide on a quarterly basis. Food safety managers who participated in this course have a very high success rate in passing the food safety certification examination as part of the course. During the four quarters when exams were given in 1999-2000, 81% - 100% of county food safety managers successfully passed the examination and earned the required food safety certification.

The food safety program in Utah responds to public concerns about pesticide and drug residues in food and improper food handling and preparation in food service establishments and in the home. Over 35 pest advisories were issued to an email list of 25 clientele and many more accessed the information via a code-a phone system. Over 200 clientele attended IPM training workshops and clinics. Through proper pest scouting and pesticide application, amounts of pesticide entering the environment is being reduced. In addition, biological control of weeds and insects further reduced the need for pesticide use. For example, over a 3-year period over 50% of dyer's woad plants in a test area were infected with a rust disease. As woad is controlled by rust, the need for pesticides is reduced.

Home gardeners need more attention for IPM programs. A program was developed to emphasis IPM to the homeowner. The program is called 'CHOOSE IPM', with each letter of CHOOSE standing for an idea that a homeowner can relate with. C = Clean and tolerate, H = Healthy plants, O = Okay plants (adapted to area), O = Options (Other options for control), S = Selectively use pesticides, and E = Evaluate. Thirty Master Gardeners are also trained in CHOOSE IPM. They in turn educate others. Eight newspaper articles were written explaining the process of IPM and published in the Standard Examiner Newspaper, which has a circulation of 160,000 readerships. The 30 Master Gardeners trained all indicated a change in knowledge and desire to use more IPM in their landscapes.

Proper use of pesticides in Utah helps reduce the chance that pesticides will enter water and that the pest management strategies will become part of non-point source pollution problem. In Salt Lake County alone 205 applicators were prepared for commercial/non-commercial applicator exams. Seventy-eight applicators were also prepared to take the general pesticide exam and the right-of-way category exams.

Pesticides and fertilizer applied to landscapes and turf can also be a cause of non-point source contamination of water. Proper water management can reduce the flow of contaminants into ground water. A "Water Check" program was established in Salt Lake County to assist with issues related to landscape water management. In 1999 the partnership of Water Districts plus Kennecott Utah Copper spent $160,000 on a media campaign advertising the Water Check telephone number and water conservation in general. The Water Check team accomplished a total to 583 residential water audits in Salt Lake County during the 2000 landscape year. This total does not include the additional audits that were accomplished during the larger projects such as Sunnybrook Park Condos, Willow Bend Complex, Salt Lake County Housing, and Mueller Park, a Davis County School. The total for Utah County is 293 completed residential water audits. Utah County has continued to have a large number of calls for water checks and as a result will continue to do water checks through September. The main focus for Utah County continues to be informing the public of the importance of water checks for their area, and educating the homeowners to be more water conserving.

Pesticide applicator training programs to prepare pesticide handlers for certification and re-certification training were conducted throughout the state. Utah pesticide applicator training programs train pesticide applicators to use pesticides responsibly. Applicators who successfully complete pesticide certification or re-certification training are more likely to calibrate sprayers properly and make pesticide applications at rates and times when a maximum number of pests can be controlled. The possibility for pesticide residue on food is greatly reduced. Applicators who complete the USU sponsored training program report (79-80%) that the program is good or very good and that it helps them realize the importance of becoming a certified applicator.

State Assessment: The programs offered within Goal 2 address critical issues in Utah. Extension faculty on campus and in the counties are responding very well to local and state-wide needs. The impacts reported here reflect a very successful program of work. They also reflect the beginning of the five-year plan. We expect that we will need to change some of the goals and indicators set at the beginning of the five-year plan because of the dynamic nature of our economy, our population, and changes in our environment.

Total Expenditure and FTE:
Smith-Lever $246,517
State Match $243,501
FTE 8.49

Utah Extension Service

Key Theme - Food Handling

A Safe and Secure Food and Fiber System

Brief Description: USU's Food Safety Managers Certification Course is offered statewide on a quarterly basis. Food safety managers who participate in this course have a very high success rate in passing the food safety certification examination as part of the course.

Impacts: Food poisoning from public food establishments has been on the rise in Utah in recent years; however, according to state statistics, the rate of food poisoning is on the decline because of mandatory training and mandatory certification. Utah State University's teamwork with the Utah State Department of Health has paid off. During the four quarters when exams were given in 1999-2000, 81% - 100% of county food safety managers successfully passed the examination and earned the required food safety certification.

Source of Funds: Smith Lever

Impacts: UT

Key Theme - Food Safety

A Safe and Secure Food and Fiber System

Brief Description: Safe home preservation of food is an on going and important issue for Utah families because of the high interest in food storage and emergency preparedness. For those who home-preserve vegetables and meats, a pressure canner must be used for safe processing; otherwise there is an increased risk for food poisoning. Pressure canner gauges are tested in Extension offices and grocery stores throughout the state. The importance of washing hands has been taught to thousands of school children in Utah through the use of Glo-Germ in the schools and as part of the science curriculum workshop for sixth-grade teachers.

Impacts: Approximately 6-22% of the pressure gauges tested by Extension staff do not give an accurate reading, which could lead to improper handling of food and subsequent food poisoning. Many gauges are close but some home canners learn that they must replace their pressure gauge to provide greater accuracy in food preservation and storage. Students and teachers learned about the importance of hand washing to prevent colds and other illnesses. Glo-Germ was used with a black light to show students if their hands had been completely washed and where they needed to wash more effectively.

Source of Funds: Smith Lever

Impacts: UT

Integrated Pest Management

Brief Description: The food safety program in Utah responds to public concerns about pesticide and drug residues in food and improper food handling and preparation in food service establishments and in the home.

General Activities: The IPM project leader collected weather data, ran weather-based models to use in predicting insect and disease activity, provided county agents with insect and disease advisories, and recommendations for managing pests. In addition, pest advisories and information concerning the timing of pesticide treatments were supplied to stakeholders via the Utah County code-a-phone system, email, the world-wide-web (www), and workshops and seminary. Other activities included weekly pest scouting trips; assisting in the development of several tree fruit insect Extension bulletins and an IPM manual; providing training to growers in pest scouting, identification, and control; testing reduced-risk insecticides which could act as replacements for organophosphates against key fruit pest; assisting county agents by ordering insect trapping supplies; organizing and coordinating the Utah Extension IPM Mini-Grant program; and communication and collaborations with other relevant USU Extension and state agencies regarding pest management issues (e.g., PIAP, PAT, Utah Department of Agriculture and Food, Utah Insect Ad Hoc Committee, Utah State Horticulture Association.)

Impacts: Over 35 pest advisories were issued to an email list of 25 clientele and many more accessed the information via a code-a phone system. Over 200 clientele attended IPM training workshops and clinics. Three new IPM Extension fact sheets were developed, an IPM portion of a SARE manual was written, two IPM press releases were written, five research projects addressed grower-identified pest management needs, six counties were provided with insect trapping supplies, and over five industry or government agency committee meetings were attended where pest management perspectives were represented. Through proper pest scouting and pesticide application reduced amounts of pesticide enter the environment. In addition, biological control of weeds and insects further reduces the need for pesticide use. For example, over a 3-year period over 50% of dyer's woad plants in a test area were infected with a rust disease. As woad is controlled by rust, the need for pesticides is reduced. Home gardeners need more attention for IPM programs. Home gardeners generally have little or no training in pest management, yet they use millions of dollars worth of “over-the-counter” pesticides each year. Greater emphasis on targeting IPM education toward homeowners is an important step toward developing comprehensive IPM programs. A program was developed to emphasize IPM to the homeowner. The program is called “CHOOSE IPM”, with each letter of CHOOSE standing for an idea that a homeowner can relate with. C = Clean and tolerate, H = Healthy plants, O = Okay plants (adapted to area), O = Options (other options for control), S = Selectively use pesticides, and E = Evaluate. Thirty Master Gardeners are also trained in CHOOSE IPM. They in turn educate others. Eight newspaper articles were written explaining the process of IPM. The eight articles were published in the Standard Examiner Newspaper, which has a circulation of 160,000 readers. The 30 Master Gardeners trained all indicated a change in knowledge and desire to use more IPM in their landscapes.

Source of Funds: Smith Lever, State

Impacts: UT

Utah Pesticide Impact Assessment Program

Brief Description: Proper use of pesticides in Utah helps reduce the chance that pesticides will enter water and that the pest management strategies will become part of non-point source pollution problem.

In Salt Lake County alone 205 applicators were prepared for commercial/non-commercial applicator exams. Seventy-eight applicators were also prepared to take the general pesticide exam and the right-of-way category exams. Pesticides and fertilizer applied to landscapes and turf can also be a cause of non-point source contamination of water. Proper water management can reduce the flow of contaminants into ground water. A "Water Check" program was established in Salt Lake Count to assist with issues related to landscape water management. In 1999 the partnership of Water Districts plus Kennecott Utah Copper spent $160,000 on a media campaign advertising the Water Check telephone number and water conservation in general. We had an input into the TV, radio and newspaper advertising. They also

created 'Water Lou' to drive in parades, participate in festivals and pass out information. In May 2000 Brenda Bell was hired part time to conduct a telephone survey demonstrating the actions taken by participants and the attitudes of people participating in the 1999 Water Check program.

Impacts: The total number of water checks accomplished during the 1999 summer program was 446. Bell spoke with 136 (30%) of these participants between May 1 and May 10, 2000,asking them three questions: a) Was the water check helpful? YES = 131 (97%) NO = 1 DON'T KNOW = 4; b) Did you modify or improve your irrigation system as a result of the water check? YES = 89 (65.4%) PLAN TO = 13 (9.6%) NO = 21 (15.4%) SYSTEM OK = 13 (9.6%). c) Did you change your landscape or reduce your lawn area? YES = 22 (16.2%) PLAN TO = 15 (11.0%) NO = 99 (72.8%) During the survey we found a person that had one of our lost soil probes and several people were very complementary on the useful information left by the interns. The water check team accomplished a total to 583 residential water audits in Salt Lake County during the 2000 landscape year. This total does not include the additional audits that were accomplished during the larger projects such as Sunnybrook Park Condos, Willow Bend Complex, Salt Lake County Housing, and Mueller Park, a Davis County School. The total for Utah County is 293 completed residential water audits. Utah County has continued to have a large number of calls for water checks and as a result will continue to do water checks through September. The main focus for Utah County continues to be informing the public of the importance of water checks for their area, and educating the homeowners to be more water conserving. Because of the increased demand for water checks as the season came to a close, the water check procedure was modified to only require one hour per visit. The week of May 8 was used to thoroughly train the Water Check team and prepare them for their role as customer service agents for the water districts.

Source of Funds: Smith-Lever, State

Impacts: UT

Key Theme - Food Borne Illness

A Safe and Secure Food and Fiber System

Brief Description: Food borne illness is a major cause of death, claiming the lives of the most vulnerable populations including the elderly, youth, pregnant women, people with impaired immune function, and the chronically ill. It also causes needless lost time from production roles in the workplace. Educational sessions were held in elementary schools to teach children proper hand washing techniques and the importance of clean hands when handling food.

Impacts: One week after the educational training 60% of students reported that they were washing their hands more often and for a longer period of time at each washing. At least 50% said they had shared this information with other members of their family or friends.

Source of Funds - Smith Lever

Impacts: UT

Key Theme - Food Quality

Utah Pesticide Impact Assessment Program

Brief Description: Pesticide applicator training programs to prepare pesticide handlers for certification and re-certification training were conducted throughout the state. Utah pesticide applicator training programs train pesticide applicators to use pesticides responsibly.

Impacts: Applicators who successfully complete pesticide certification or re-certification training are more likely to calibrate sprayers properly and make pesticide applications at rates and times when a maximum number of pests can be

controlled. The possibility for pesticide residue on food is greatly reduced. Applicators who complete the USU sponsored training program report (79-80%) that the program is good or very good and that it helps them realize the importance of becoming a certified applicator.

Source of Funds: Smith Lever

Impacts: UT

" \l 3**Utah Agricultural Experiment Station**

Key Theme: Other - Plant and Animal Health and Safety: *Identification*

Plant and Animal Health and Safety

Brief Description: Work is underway in an attempt to identify whether *scrapie* (a fatal virus disease of sheep) is transmitted through the embryo and/or uterus and at which point the embryos are at risk of exposure and infection. Scientists are also attempting to refine methods of short-term and long-term embryo maintenance. Tests (probes) are being developed for identifying the spider lamb syndrome gene in Suffolk sheep, with broad procedural implications for other livestock (and even human) species. In relation to these tests, high resolution comparative genome maps for sheep are being developed (similar to that done under the human genome project). The effects of toxic plants are being identified, as are the potential reproductive toxic effects of cadmium and other heavy metals on agricultural animals. The biology and life history of the plum curculio in northern Utah is being studied as a first step in identifying methods of control.

Impacts: Though still in progress, it is anticipated that this work will enhance the quality of the food and fiber made available to the general public as various diseases, pests, and other problems are identified. Much of the work will have application across multiple species even though the work is presently directed toward a single species.

Source of Funds: Hatch Act

Utah (UTA) CRIS Project Numbers:

102	170	626
123	415	
153	462	

Funding Level: $526,461 **FTE:** 2.3

Scope of Impact: National and International

Key Theme: Other - Plant and Animal Health and Safety: *Control*

Plant and Animal Health and Safety

Brief Description: Attempts are underway to identify the effects of and clear where appropriate control agents for minor crop and livestock uses. In addition, we are developing integrated methods of parasite control for improved livestock production, as well as studying the natural enemy efficacy and ecological/physiological basis for interactions through biological control. Research is being conducted at the USU Kaysville Experimental Farm on integrated pest management. A serious weed problem in Utah, *dyer's woad*, is being examined to determine the potential of the *Puccina thlaspeos* as a biological control agent. Work is also underway in developing the appropriate integration of cultural, biological, and chemical control of various weeds in field crops grown in Utah.

Impacts: Plant and animal health is being improved through the development of these control processes. While much of the work is being done within single species, there is significant potential for action on multiple species, through the process involved or the actual agent developed.

Source of Federal Funds: Hatch Act

Utah (UTA) CRIS Project Numbers:

103	524	624
133	618	743

Funding Level: $749,942 **FTE:** 2.8

Scope of Impact: National and International

Key Theme: Other - Plant and Animal Health and Safety: *Safety Assurance*

Plant and Animal Health and Safety

Brief Description: Toxic compounds in Utah plants are being identified and studied to determine their mode of action. The benefits and risks of pesticide use are being identified, evaluated, and disseminated as they become available. Researchers are attempting to identify several treatment strategies that will benefit American agriculture through a) reductions in losses associated with mycotoxins in poultry feeds; b) helping the poultry industry to be more productive; and c) producing a safer food for consumers. Nitrogen fertilizers applied to soils already marginally saline, increase salinity and inhibit further plant growth. Salt-tolerant alfalfa, when inoculated with R. meliloti, fixes atmospheric N2 into an available form and, thus, plants require only minimal N2 fertilizer. The annual rate of N2 fixed by alfalfa/R meliloti may range from 300 to 600 kg N ha-l.

Impacts: Though still in progress, it is anticipated that this work will provide better quality assurance to consumers as various problems are identified. Much of the work will have application across multiple species even though the work is presently directed toward a single species. Use of salt-tolerant alfalfa and R. meliloti to fix only 50 kg N ha-l would be worth nearly $2 billion a year to the U.S. in increased forage production and fertilizer nitrogen.

Source of Federal Funds: Hatch Act

Utah (UTA) CRIS Project Numbers:

126	445	760
444	459	

Funding Level: $458,373 **FTE:** 1.2

Scope of Impact: National and International

Goal 3: A healthy, well-nourished population.

Overview

Through research and education on nutrition and development of more nutritious foods, USU Extension enables people to make health-promoting choices. Basic food and nutrition information is delivered in a variety of methods and locations, providing new information and motivation to improve nutritional status in families. As a result of these activities, 56% of participants increased nutrition knowledge, 22% improved diet consumed, 28% improved nutrition behaviors, 28% improved kitchen related techniques, 22% improved shopping decisions, 42% intend to change nutrition behaviors and 6% increased their food security.

Optimal nutritional status is a critical factor in health and well being of all people. The risk of some diseases, such as heart disease and cancer is reduced as participants make dietary changes. Dietary changes USU Extension participants intend to make include lowering fat intake, increasing fruit and vegetable intake, adopting an exercise program, and making meals instead of eating high fat, high sodium fast and prepared foods.

A program (Food, Fun & Fitness) was developed for Native American children in order to delay or prevent the onset of diabetes. The curriculum incorporates food selection, weight control and physical activity in a series. Youth involved in the program earned points by extra credit activities such as: exercising, making healthy food choices and doing experiments and homework assignments. Evaluations consisted of points earned and parents observations. The parent's comments were all positive on the changed eating and exercise habits of their children. Knowledge of the relationship of exercise to obesity and the onset of diabetes was increased for all 12 Native American youth involved in the program.

USU Extension has provided nutrition education for low-income families for over 30 years. These education programs empower individuals to improve diets, increase food management and budgeting skills, increase their family's economic security, lower stress in families, increase children's readiness to learn, increase self-esteem, and decrease demand on emergency food assistance

During the 2000 fiscal year USU Extension reached 1,376 families, taught 4,822 family members, and 10,035 4-H youth at risk. The number of regular daily servings of vegetables eaten changed from 2.0 to 2.7 and the number of calcium/dairy servings eaten changed from 1.7 to 2.3. Money spent on food/person/month changed from $76.80 to $72.90 and a vast majority of homemakers showed improvement in one or more food resource management practices, in one or more nutrition practices, and in one or more food safety practices.

State Assessment: The programs offered within Goal 3 address critical issues in Utah. Extension faculty on campus and in the counties are responding very well to local and state-wide needs. The impacts reported here reflect a very successful program of work. They also reflect the beginning of the five-year plan. We expect that we will need to change some of the goals and indicators set at the beginning of the five-year plan because of the dynamic nature of our economy, our population, and changes in our environment.

Total Expenditures and FTE:
Smith-Lever $185,831
State Match $183,558
FTE 6.4

Utah Extension Service

Key Theme - Human Nutrition

Nutrition and Health

Brief Description: Many ongoing Extension programs in Family Life contribute directly and indirectly to improving human nutrition. Basic food and nutrition information is delivered in a variety of methods and locations, providing new information and motivation to improve nutritional status in families. Of the agents in 28 Utah counties, 89% gave workshops, 28% gave seminars, 83% responded to individual inquiries, 50% used news releases, 67% used newsletters, 11% used radio, 17% used television, and 17% used internet.

Impacts: As a result of these activities, 56% of participants increased nutrition knowledge, 22% improved diet consumed, 28% improved nutrition behaviors, 28% improved kitchen related techniques, 22% improved shopping decisions, 42% intend to change nutrition behaviors and 6% increased their food security. As a result of these activities 72% reported producing peer reviewed teaching materials, 84% of agents produced peer reviewed teaching materials, five activities produced refereed published materials, three agents published refereed materials and 2900 individuals completed non-formal nutrition education programs.

Source of Funds: Smith-Lever, State, County

Impacts: Multi-state Extension CO, ID, WY, MT, IO, KS, MI, NB, ND, SD

Key Theme - Human Health

Nutrition and Health

Brief Description: Optimal nutritional status is a critical factor in health and well being of all people. In Salt Lake County a series of classes were taught on 16 times to a total of 374 people. The classes included: The ABC's of Nutrition and Health (based on the Dietary Guidelines 2000), Frugal Fare (low cost quick meals), Dining with Diabetes, Food Storage, the Calcium Connection (osteoporosis and calcium intake), Cooking Under Pressure (quick meals), Kitchen Gifts (inexpensive holiday gifts made in the kitchen), and Nutrition Education Ideas for Home Economics teachers.

Impacts: Health will be improved. The risks of some diseases such as heart disease and cancer will be reduced as participants make dietary changes. Dietary changes participants intend to make include lowering fat intake, increasing fruit and vegetable intake, adopting an exercise program, and making meals instead of eating high fat, high sodium fast and prepared foods. The incidence of osteoporosis may be reduced. Eleven participants stated they do not get enough calcium in their daily diet. As a result of the class they will make dietary changes or add supplements to get sufficient calcium to lower the risk of osteoporosis.

Source of Funds: Smith-Lever, State, County

Impacts: State specific

Nutrition and Health

Brief Description: Chronic disease such as coronary heart disease, cancer and diabetes can be avoided or delayed with good nutrition. Native Americans have increased risks for obesity and diabetes. A program (Food, Fun & Fitness) was developed for Native American children in order to delay or prevent the onset of diabetes. The curriculum incorporates food selection, weight control and physical activity in a series. Twelve youth in San Juan County were enrolled in Food, Fun and Fitness in order to make healthy lifestyle changes. Youth involved in the program earned points to show in the "store". They earned these points by extra credit activities such as: exercising, making healthy food choices and doing experiments and homework assignments. One girl conducted an experiment in food safety by cutting up an apple before she washed her hands and after she washed her hands. Then she set it out to see how much microrganism growth occurred with each. She found that it is always important to wash hands in food preparation, particularly with ready-to-eat foods requiring no cooking.

Impacts: Evaluation consisted of points earned and parents observations. The parent's comments were all positive on the changed eating habits and exercise habits. Knowledge of the relationship of exercise to obesity and the onset of diabetes was increased for all 12 youth.

Source of Funds: Smith-Lever, State, County

Impacts: UT

Key Theme - Birth Weight/Infant Mortality

Nutrition and Health

Brief Description: Good nutritional status is a critical factor in the health and well being of all people, but especially important for high risk groups such as infants, pregnant women, teenagers, elderly and low income. Scientific evidence links nutrition to behavioral and cognitive development in children and birth weight. The Extension Campus Field Office provides services to student families with a high percentage of international students. Thirty-two young women who were pregnant or preparing for pregnancy participated in a class about healthy choices before pregnancy. The class series included nutrition, exercise and general health.

Impacts: Knowledge of nutrition and the relationship of nutrition to pregnancy outcomes increased for all participants. They all agreed to make healthy food choices associated with pregnancy outcomes.

Source of Funds: Smith-Lever, State, County

Impacts: State specific - UT

Key Theme - Nutrition Education

Nutrition and Health

Brief Description: In 1969 Cooperative Extension Service at Utah State University received federally appropriated money to provide nutrition education for low-income families in the state. USDA's Expanded Food and Nutrition Education Program (EFNEP) was created to improve the nutritional health of poor people. For nearly 30 years trained paraprofessionals have been teaching nutrition and food management to families enrolled in the program. During those 30 years federal funding has remained level, thus limiting the number of counties served. Additional funding was appropriated July 1, 1995, by the Utah State Legislature for nutrition education. Other federal funding sources were acquired in November 1999, when Utah State University Extension was awarded a grant from the USDA Food Stamp Program to provide nutrition education in all counties in the state. The following includes some of the things the program does:
* Empowers individuals to improve diets
* Increases food management skills
* Increases ability to plan and keep budgets
* Increases family's economic security
* Lowers stress in families
* Increases children's readiness to learn
* Increases self-esteem
* Decreases demand on emergency food assistance

Impacts:
* Reached 1,376 families
* Taught 4,822 family members
* Taught 10,035 4-H youth at risk
* 56% of families were enrolled in one or more food assistance programs
* 90% of households were headed by females
* 52% of families were located in cities and suburbs over 50,000
* 48% of families were located in towns and rural areas
* 43% of families were at or below poverty level for income
* The number of regular daily servings of vegetables eaten changed from 2.0 to 2.7
* The number of calcium/dairy servings eaten changed from 1.7 to 2.3
* Money spent on food/person/month changed from $76.80 to $72.90
* 87% of homemakers showed improvement in one or more food resource management practices
* 94% of homemakers showed improvement in one or more nutrition practices
* 63% of homemakers showed improvement in one or more food safety practices

Source of Funds: Smith-Lever, State, County, Food Stamp Office via Utah Workforce Services

Scope of Impact: State specific - UT

" \l 3**Utah Agricultural Experiment Station**

Key Theme: Other - Agricultural Product Enhancement

Agricultural Product Enhancement

Brief Description: Work is underway evaluating and comparing the genetic progress of five commercially available strains of turkeys. Researchers are also examining the impact of calfhood exposure to low-quality forages to determine the impacts that such exposure will have on mature meat quantity and quality. Scientists are developing an improved understanding of ruminant response to strategic supplementation of dormant, low quality forages during winter as well as improved ability to characterize protein content of forages so we can improve our ability to balance rations for grazing ruminants. This should contribute to improved animal performance, reduced feed cost, and increased nutrient retention, which will improve animal nutritional status and reduce environmental contamination with wasted nutrients, including excreted nitrogen and respired methane. Low-fat red meat products are being developed, as are dairy products utilizing ultra-high temperature processing (which extends shelf life). The impacts associated with cheese processing are being examined to determine what changes occur in the structure of casein. Those factors which influence Cheddar cheese flavor are being identified. The use and application of biotechnology in food processing are being examined in the context of Utah's food processing market. Dryland winter and irrigated wheat, barley, spring wheat, and oat varieties that possess resistant to major diseases and pests in Utah are being developed. Researchers are attempting to determine if characteristics of *apomixis* (i.e., hybrid cloning themselves) can be introduced into commercial agricultural crops. Methods of water delivery and timing to vegetable crops are being examined to enhance water use efficiency and conservation. Barley (a concentrate feed more common in Utah) is being substituted for corn (a concentrate feed less common and more expensive in Utah) to determine its impacts on milk protein secretion in lactating dairy cows. The effects of modified milk fats on physical, chemical, manufacturing, and sensory properties of dairy products are being characterized. Studies are underway to examine whether sustainable cropping systems (and rotations) are applicable to the unique dry, cold climate of the Intermountain West. Various production practices are being evaluated with respect to their performance and economic return for retained ownership beef calves. The best growout temperature that yields optimal feed conversion for turkeys is being determined and the influence of solar spectral balance on the UV-B responses of plants is being identified.

Impacts: Low fat red meat products from lamb, beef, and pork have been developed and are currently at various stages of commercialization. Ultra high temperature milk processing has been developed which extends unrefrigerated milk life up to a year and the product is under commercial production and has been utilized by the U.S. military. Several new varieties of food and feed grains have been developed which are resistant to Utah and Intermountain West diseases and pests. These varieties have been or are being released for commercial production. A process of utilizing *apomixis* (i.e., the ability for hybrids to clone themselves) has been developed and is close to commercialization. This would allow hybrids to be produced from hybrid seed, rather than from the seeds of two or more parents and would greatly reduce the cost and improve the quantity and quality of many foods and feeds. It has been shown the CLA (a product found in dairy products, particularly those obtained from fresh pasture) is effective in reducing various forms of cancer, though work continues in this area. Work in many other areas is continuing.

Source of Funds: Hatch Act

Utah (UTA) CRIS Project Numbers:

114	223	423
157	241	431
179	244	451
195	328	461
213	337	735
217	344	913
222	417	920

Funding Level: $3,497,300 **FTE:** 8.9

Scope of Impact: National and International

Goal 4: Greater harmony between agriculture and the environment.

Overview

Goal 4 is a very broadly based goal concerning enhancement of the "quality of the environment through better understanding of and building on agriculture's and forestry's complex links with soil, water, air, and biotic resources." Research based programs focus on soil, water, air, plant and animal life, forests, rangelands, and aquatic and other ecosystems. These programs incorporate public issues in education, land-use planning, the concept of shared decision-making, and the use of information systems. These programs address renewable and non-renewable natural resources in urban and rural settings. They involve people, communities, and organizations in experiences that apply appropriate technology to everyday problems. Reliance on scientific methods and principles enables our Extension professionals to deliver objective information, even when the issues are emotionally charged.

Numerous specialists and agents have been working with private producers and state and federal agencies to develop a statewide program of animal waste management, provide training programs to achieve the program's adoption, and implement the program's provisions to achieve cleaner water resources. This program has become recognized nationwide as a model program built on involvement of all affected interests, cooperation and collaboration of these interests in its development, and on-the-ground assistance by teams of expert professionals to implement the program.

Other teams have been working with livestock producers and commodity organizations to improve management through the application of research based information. The results have been improved watershed values, improved wildlife habitat, reduced production costs, and increased revenues. As part of this activity, considerable effort has been expended to assist landowners to develop alternative income sources to traditional agriculture such as outdoor recreation that includes hunting and fishing, wildlife viewing, backpacking, backcountry skiing and snowshoeing, and on-ranch work experiences.

The program concerning animal waste management having been recognized as a model program has raised awareness and interest in other states. Specialists and agents have been working with other states to provide information to assist these states with development and adoption of similar programs to meet their water quality standards.

Big Game Hunting Units and Cooperative Wildlife Management Units have provided significant alternative income opportunities to private landowners and ranchers. With the addition of a new Extension program in Outdoor Recreation and Tourism funded by the Utah State Legislature, additional income producing opportunities are being explored and adopted that have the promise of providing income at other times of the year in addition to hunting seasons.

The programs described above have resulted in millions of dollars being saved by communities in treatment and remediation costs and millions of new dollars produced from out-of-state clientele. In addition, programs in urban forestry have resulted in economic growth to Utah's Green Industry through savings in operational costs and added income.

State Assessment: Utah has made excellent progress toward meeting its 5-Year Plan of Work goals under Goal 4 during this reporting year. In fact, progress has exceeded expectation in the areas mentioned above. Adoption of programs and management options has occurred much faster by the affected public than anticipated. Economic benefits have increased at a much more rapid rate than anticipated. This has been recognized by the Utah State Legislature and has resulted in increased A line-funding to implement numerous new Extension programs.

Total Expenditures and FTE:
Smith-Lever $484,904
State Match $478,972
FTE 16.7

" \l 3**Utah Extension Service**

Key Theme - Agricultural Waste Management

Utah Confined Animal Feeding Operation Advisory Committee

Brief Description: Extension specialists provided advisory help and counseling for the Utah Confined Animal Feeding Operation Advisory Committee and the Bear River Local Work Group. They also provided advisory help and counseling for the Utah Memorandum of Agreement on Animal Waste Storage Structures Taskforce and for the following operations at the request of the USU Extension county agriculture agents: John Nye Dairy, Delta, UT [Agent Mike Pace]; BYU Spanish Fork Dairy, Spanish Fork, UT [Agent Dean Miner]; Westside Delta Dairy, Delta, UT [Agent Mike Pace]; Delta Egg Farm, Delta, UT [Agent Mike Pace]. Extension provided advisory help and counseling for various dairy operations in Lincoln County, Afton, WY [USU Extension Dairy Specialist Ron Boman and UW-Lincoln County Cooperative Extension Educator Gurn Brown] and they provided advisory help to the Utah Dairyman's Association Board of Directors. There is a great deal of interest from the board members in moving the Utah dairy industry in the direction of sustainability. However, there seems to be no clear vision or direction about which way to move. Extension provided advisory help to Utah Department of Environmental Quality concerning a green labeling program. Served as content area specialist during review of Farm*A*Syst documents. Served as content area specialist and presenter during workshops in Beaver, Manti, and Richfield on Utah's evolving Animal Feeding Operation Strategy and how producers may be affected. This workshop provided the following: background information on water quality issues and regulations in Utah, how to determine if your operation is an AFO or a CAFO, Comprehensive Nutrient Management Plans, and Farm*A*Syst and other available resources to help Utah producers with water quality issues. Presented 4 workshop sessions concerning the available resources. These workshops ran for five and a half hours. There was no charge and lunch was included. USU Extension, Utah Association of Conservation Districts, Utah Farm Bureau, USDA Natural Resource Conservation Service, Utah Department of Agriculture and Foods, and Utah Department of Environmental Quality sponsored these workshops. Extension provided advisory help and counseling during two field trials of the Inventory and Assessment document for the Utah Strategy as requested by Mark Peterson [Utah Farm Bureau Federation] and Ray Loveless [Utah Association of Conservation Districts]. Extension provided advisory help and counseling during a pre-design conference for the John Nye Dairy, Delta, UT at the request of Mike Pace [USU Extension County Agent] and John Nye [Dairyman] and provided advisory help and counseling during an evaluation of the BYU dairy at Spanish Fork. Dick Allen, manager, was concerned about the waste handling system and should it be up-dated or improved. With the assistance of the regional USDA-NRCS engineering staff, it was determined that the current system on the dairy was adequate and unless the number of cows increased BYU should not have to make any additions or modifications to the system.

Impacts: Most producers and agency personnel in the state are now aware of background information on water quality issues and regulations in Utah, how to determine if an operation is an AFO or a CAFO, Comprehensive Nutrient Management Plans, and about Farm*A*Syst and other available resources to help Utah producers with water quality issues.

Source of Funds: State

Impacts: State Specific - UT

Sustainable livestock production: Animal feeding operations and environmental quality (AFO programs)

Brief Description: As a member of the Utah State Concentrated Animal Feeding Operation Committee, the Extension specialist developed information and educational materials to assist in the implementation of the Unified National Strategy for Animal Feeding Operations. Materials included: two information/education documents written primarily by the specialists; the research, development and implementation of manure sampling and analysis protocols for the Utah State University testing lab; the development of an in-service training program on comprehensive nutrient management planning for producers and agency personnel; the development and implementation of a monthly satellite broadcast program on the strategy and developing comprehensive nutrient management plans; the development and testing of web-based in-service training methods and materials for manure management. Numerous attempts to secure extramural funding for these efforts have also been made.
Impacts: This is a start-up program and the strategy is now in the implementation phase. Much of the work delivering these programs and materials remains to be done and impacts assessed. To date, 11,000 copies of the information and

education documents have been printed and distributed, one in-service training program has been delivered to 56 state and federal agency personnel, four satellite broadcast programs have been developed and delivered with a total audience of 83. The manure testing program developed during the reporting period has significantly increased manure samples submitted to the Utah State University testing lab during the reporting period. Sample numbers went from < 10 per year to approximately 85 after the implementation of the project.

Source of Funds: CES

Impacts: state specific, integrated research and extension

In-House Composting of Poultry Manure

Brief Description: A research and Extension program on in-house composting in high-rise, caged-layer facilities was initiated in 1999. This objective of this project was to evaluate the process under western U.S. conditions and develop management protocols for composting inside high-rise layer houses. A series of experiments was conducted to address different aspects of the process, including the effects of bird age, bulking agent type and rate, and turning frequency. Initial research results demonstrated that the process worked and led to management recommendations for the cooperators and other poultry producers. Follow-up work now in progress is addressing ammonia volatilization and reduction from composting manure.

Impacts: This research and Extension effort has demonstrated that in-house composting can be successfully practiced in the western U.S. As a result of the program all egg producers in Utah are now practicing in-house composting to reduce fly control problems and generate a more usable product. The in-house composting research has saved poultry producers in Utah County approximately $10,000 per year in reduced fly control costs. Two refereed papers have been published to date, one SARE grant submitted and funded, and another grant to U.S. Poultry submitted.

Source of Funds: SARE

Impacts: state specific, integrated research and Extension

CSREES budget - $60,975

Key Theme - Endangered Species

Endangered Species

Brief Description: Extension specialists have developed a community-based conservation program designed to increase local participation in species conservation. The program has developed two working groups, the San Juan County Gunnison Sage Grouse Working Group (SWOG) and the Parker Mountain Adaptive Resource Management Working Group (PARM). SWOG includes 40 private landowners in San Juan County, Utah. PARM includes 80 landowners in Wayne and Piute Counties in Utah. These groups are chaired by local landowners and consist of representative of various public and private wildlife management and conservation agencies and organization. The working groups meet regularly to discuss, plan, implement, and evaluate management actions designed to assist in sage grouse and the Utah prairie dog conservation and sustain local economies.

Impacts: Both working groups have developed and implemented long-term conservation plans. In San Juan County, the plan has resulted in the development of 37,000 acres of sage grouse habitat. In addition, conservation easements have been used to protect another 3000 acres of critical habitat. This effort annually generates $1.2 million for local landowners. We have seen a 200% increase in Gunnison sage grouse populations. PARM has funded a 2 year research project to find out why sage grouse and Utah prairie dogs have been declining. The project identified reduced vegetation diversity as a result of increasing sagebrush encroachment was impacting sage grouse, Utah prairie dogs and livestock forage potentials. In 2000, PARM raised $50,000 to treat 5000 acres in an effort to reduce sagebrush competition. The

results of this effort are currently being monitored. Parm was recognized as an Enlibra project by the Western Governor's Association.

Source of Funds: State, public and private wildlife management agencies and organizations, private landowners, and the S.J. and Jessie Quinney Foundation

Impacts: Multistate Extension - With ID, NV, CO

Key Theme - Forest Resource Management

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Rural and Community Forestry Extension

Brief Description: Extension forestry in Utah provides educational programming in rural, urban, and wildland - urban interface forestry and in agroforestry. The Utah Forest Landowner Education Program provides current, unbiased, helpful information to Utah's private forest landowners and others interested in the management of forest lands in Utah. Urban/community forestry and wildland-urban interface forestry assistance is provided direct to towns and cities and indirectly by working with the Utah Community Forest Council. Agroforestry assistance is provided mostly by training agents and others. Education is provided in a comprehensive fashion through newsletters, workshops, sponsoring agent training and participation in conferences, participating in public-outreach events, news releases, and providing direct landowner and Extension agent assistance.

Impacts: A newsletter reaches 1,500 landowners and others quarterly (positive feedback includes "A beautiful job on the recent newsletter, one of the best ag-related things that the state does to help novice landowners to manage their forest land"). Public outreach events reached 2,600 people directly. The Extension helped one particular forest landowner save $94,000 on a fire loss and helped another with a 350 acre blow down. $300,000 in saved trees or landscape value at an urban forestry project in Salt Lake City. 330 professionals were trained in tree biology, planting, and care at three conferences; a discussion was led of statewide revision of planting recommendations by Utah's nursery industry. Professional tree care workshops had 132 attendees who work with over 18,000 clients/customers and over 98,000 trees per year and whose knowledge, customer service, and tree care quality all will be improved. Windbreak short course was highly rated by attendees (8.8 to 9.9 out of 10).

Source of Funds: State, Smith-Lever 3b & 3c

Impacts: State-specific

Key Theme - Integrated Pest Management

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Noxious Weed Control

Brief Description: The USU Extension weed specialist provided numerous state, regional, and national integrated weed management training seminars and workshops to field personnel and program leaders from the USDA Forest Service, USDI Bureau of Land Management, the USDI National Park Service, and other public land management agencies. Field studies were conducted integrating the use of herbicides, burning, and reseeding to manage squarrose knapweed and medusahead on rangeland. Extension weed identification and/or management publications developed or revised included Weeds of the West, Montana-Utah-Wyoming Weed Management Handbook, and Noxious Weed Field Guide for Utah.

Impacts: More than 3200 people received direct training from the USU Extension weed specialist in the identification and management of noxious and invasive weeds on public lands. USU was instrumental in the Bureau of Land Management development of a national weed-awareness training program that is currently being presented to all BLM employees. Seminars were presented in Utah, Colorado, Arizona, Idaho, Florida, West Virginia, and Brazil. Attendees at the U.S. seminars were from throughout the United States. The Brazilian conference included participants from 62

countries. Weeds of the West has become a popular publication throughout the United States and other countries, with more than 90,000 copies sold to this point.

Source of Funds: Smith-Lever

Impacts: Multi-National Extension - With UT, CO, AZ, ID, FL, WV, BRAZIL

Invasive Species Program

Brief Description: USU's Extension weed specialist was appointed by the U.S. Secretary of Interior in 2000 to represent the Weed Science Society of America on the National Invasive Species Advisory Committee. Part of the committee's responsibility was to help the Invasive Species Council develop a national plan for management of invasive species

Impacts: USU's representation on the National Invasive Species Advisory Committee contributes to the completion of the National Invasive Species Management Plan, which incorporates all major elements of the wildfire/weed management model previously developed by USU.

Source of Funds: U.S. Department of Interior

Impacts: National and international (participated with ISC and other ISAC members in a bi-national invasive species workshop in South Africa)

Rangeland Brush Control

Brief Description: Extension specialists and agents worked with landowners in Southern Utah to assess the efficacy of three herbicides applied under prescription for control of previously burned and unburned rubber rabbitbrush. The goal of the effort was to identify cost effective ways of reclaiming productive land dominated by rabbitbrush by properly timing application of herbicides and combining burning with properly timed herbicide application. Reclaiming rabbitbrush-dominated previously farmed valley bottoms and rangelands has been cost prohibitive and ineffective with traditional methods. Extension personnel, producers, researchers and county weed department personnel worked cooperatively to initiate research and demonstrations relative to methods of control of invading medusahead rye in Northern Utah. Cooperators: Private Landowners, Garfield County, Cache County, Utah State University Extension, USDA Agricultural Research Service Forage & Range Research Lab, Utah Grazing Land Conservation Initiative.

Impacts: Rabbitbrush control demonstrations have motivated 10 landowners in Garfield and Kane Counties to plan rabbitbrush control on invaded land. Landowners in Cache County formed a Coordinated Resource Management (CRM) group for dealing with medusahead rye and as a model for dealing with other invasive plants in Cache County, Utah. This model approach is especially well suited for eliciting cooperation of organizations and individuals and coordinating efforts in dealing with invasive weeds. It will serve as a model for counties dealing with invasive weed problems.

Source of Funds: Utah GLCI

Impacts: State Specific

Key Theme - Natural Resources Management

Rangeland and Pasture Conservation

Brief Description: Extension specialists worked within the Utah Grazing Land Conservation Initiative (GLCI) coalition to guide the Coalition in the revision of the Utah GLCI Strategic Plan. The Coalition applied and received non-profit

corporation status [(501)(c)(3)] to improve the group's ability to compete for grants for rangeland and pasture conservation education programs. Twelve private rangeland and pasture demonstration projects were sponsored by the Coalition focusing on innovative and creative ways for landowners to enhance rangeland and pasture. Demonstrations included fencing, water development, forage trial, pasture renovation, grazing management and vegetation manipulation. These demonstrations formed the basis for posters and presentations at producer meetings throughout the State. The Coalition sponsored three local tours to visit farms and ranches cooperating on demonstration projects. Cooperating Organizations: Utah Farm Bureau Federation, Utah Cattlemen's Association, Utah Wool Growers Association, Utah Farmers' Union, Utah Association of Conservation Districts, Natural Resources Conservation Service, Utah Department of Agriculture and Food, Utah Division of Wildlife Resources, Utah State University Extension, U.S. Forest Service, Bridgerland Applied Technology Center, Utah Section of the Society for Range Management, USDA Agricultural Research Service Forage & Range Research Lab.

Impacts: More than 750 people attended meetings and were introduced to programs and opportunities for improving wildlife habitat on private lands. Local tours attracted 95 people interested in grazing land conservation. One cooperator presented the results of his pasture renovation demonstration through a poster at the National Grazing Land Conference in Las Vegas (attendance 860). An Extension agent also made a poster presentation on use of municipal sewage effluent for pasture irrigation.

Source of Funds: Natural Resources Conservation Service and Grazing Land Conservation Initiative

Impacts: State Specific

Key Theme - Nutrient Management

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Sustainable Livestock Production

Brief Description: The Dairy specialist is conducting an experiment/demonstration on the addition of microbial additives to manure lagoons to reduce the organic matter accumulation. The effluent from these lagoons is sprinkled onto pastures where the effluent nutrients are used by the pasture plants during the growing season. Holstein dairy heifers grazing these pastures gained an average of 900 kg live weight/day. Eight tour groups have visited these research demonstrations. Newsletter articles have been written and workshops and seminars have been given to acquaint producers with these nutrient management practices. Additionally, newsletters have been written, workshops and televideo conferences presented on feeding methods to reduce the excretion of nutrients (especially Phosphorus and Nitrogen) in manure. Cooperating Institutions/Organizations: Utah Dairyman’s Association, Utah Department of Agriculture and Food, Utah Department of Environmental Quality, and Utah Farm Bureau.

Impacts: More than 100 dairy producers, mainly in Utah, but also in Montana, Nevada, and Wyoming have either been at these research/demonstrations, attended the seminars and televideo conferences, or have received a personal "on-the-farm" consultation concerning nutrient management. This represents approximately 18% of the dairy farms in these four states. Dairy producers are paying more attention to nutrient management and even the nutritional consultants and feed advisors are realizing that they can reduce their recommended phosphorus levels and improve nitrogen utilization through the use of rumen by-pass protein and amino acid supplementation.

Source of Funds: Smith-Lever, State

Impacts: Multi-state Extension - With UT, MT, NV, WY

Key Theme - Recycling

Beneficial Use of Biosolids

Brief Description: An Extension specialist has served on the Utah State Department of Environmental Quality's biosolids agronomic rate advisory committee since 1995. As part of service on this committee the specialist helped develop agronomic application guidelines for biosolids in Utah. These guidelines included two Extension bulletin publications on land application of biosolids, one for treatment plant operators and one for farmers. In addition to this committee service, the specialist submitted an Experiment Station research project designed to evaluate biosolids application effects on grass forage productivity and quality. This research project was completed with the 2000 field season. Finally, several Extension county agents and specialists have worked to develop relationships between treatment plant operators and farmers in using biosolids for agronomic purposes. Agents have worked with Cedar City and Provo City to dispose of biosolids and treated wastewater on farm ground. Extension specialists have worked with a south Salt Lake treatment plant to land apply biosolids in Tooele County.

Impacts: Historically, all municipal sewage sludge (biosolids) was disposed of in landfills, on land owned by treatment facilities, or as a mine reclamation material at Kennecott. Treatment plants in at least five urbanized Utah counties are now distributing the majority of their biosolids to farmers for agronomic use. Approximately 50% of biosolids in Utah are now used in agronomic applications. The economic impact of this change is significant and translates into lower costs for municipal sewage treatment and utility costs to individual homeowners.

Source of Funds: Utah Agricultural Experiment Station and CES

Scope of Impact: state specific, integrated research and Extension

CSREES budget - $4250.00 annually since 1996 in AES budget; CES budget unknown since it included time and travel expenses

Key Theme - Sustainable Agriculture

Outdoor Recreation and Natural Resource-Based Tourism

Brief Description: Outdoor Recreation and Natural Resource-Based Tourism is a new area of program emphasis in Extension at Utah State University facilitated through the Institute for Outdoor Recreation and Tourism (IORT). The first-ever Extension specialist in Outdoor Recreation and Tourism and the Director of IORT in Extension this past year has focused efforts on 1) increasing awareness among a number of different constituencies in Utah of IORT's mission and program functions; 2) providing information on a variety of topics related to outdoor recreation and natural resource-based tourism development; 3) consulting activities that may provide the foundation for the more formal development of specific projects in the future; 4) developing and cultivating relationships with federal, state, and local government agencies and officials, non-governmental organizations, and individuals in the private sector; 5) collaborating with other Extension specialists; and 6) conducting a research project assessing the role of tourism and tourism-related development in selected rural counties in Utah.

Impacts: (1) Increasing awareness among a number of different constituencies in Utah of IORT's mission and program functions, thirteen different presentations were made to a variety of groups. In each presentation, as an introduction, IORT's mission and program functions in research, Extension, and teaching were presented. In all, approximately 200 individuals have been reached through these efforts.

(2) Providing information on a variety of topics related to outdoor recreation and natural resource-based tourism development, presentations on the topics of outdoor recreation, natural resource-based tourism, nature tourism, agricultural tourism, and heritage tourism were made to a number of different groups that include members of the Wayne County Travel Council Board, County Extension Agents and members of the Cattlemen's Association in Tooele County, interested ranchers and the Executive Committee of the Bear River Resource Conservation & Development Council in Rich County, participants at the 4th Annual Uintah Basin Business Symposium, the Steering and Planning Committee of the Great Salt Lake Bird Festival in Davis County, partners in the Bear River Heritage Area Council that included Box Elder, Cache, and Rich Counties in Utah and Franklin and Bear Lake Counties in Idaho, participants in a mini-conference on developing tourism resources in Duchesne County sponsored by the Dinosaurland Resource

Conservation & Development Council, and the Utah Farm Bureau's Chief Executive Officer, Director of Field Services, Communications Director, and Regional Managers. In addition, work has been completed on the development of IORT's website through the College of Natural Resources that contains information on the mission and program functions, personnel, advisory board, affiliated faculty, publications, research projects, educational programs, websites of interest, and contact information.

(3) Consulting activities that may provide the foundation for the more formal development of specific projects in the future, an initial consultation was completed with the Director of the Wayne County Office of Economic Development and Travel Council that involved assessing the past and ongoing efforts of the Wayne County Travel Council in tourism development efforts. In the future, IORT will be assisting in facilitating county-wide participation and support especially in relation to what the local population feels tourism should be in Wayne County. Other consulting activities include work with Bill Day, Horse Extension specialist, on the Utah Horse Trails Guide, active involvement as a partner in the Bear River Heritage Area Council, active involvement with Canyonlands Field Institute (CFI) serving as an ex-officio board member and working with the Executive Director in CFI's Graduate Residency in Environmental Education Program (GREEP), and active involvement with the Steering and Planning Committee of the Great Salt Lake Bird Festival where IORT will be conducting a visitor survey of this coming May's festival.

(4) Developing and cultivating relationships with federal, state, and local government agencies and officials, non-governmental organizations, and individuals in the private sector a number of activities have occurred this past year. First and foremost, an Advisory Board for IORT has been organized with representation from the USDA Forest Service, National Park Service, Bureau of Land Management, U.S. Fish & Wildlife Service, Utah Division of Parks and Recreation, Utah Division of Travel Development, Utah Division of Wildlife Resources Nature Tourism Program, Utah Rural Development Center, University of Utah's Department of Parks, Recreation and Tourism, Brigham Young University's Department of Recreation Management and Youth Leadership, and Commercial Sector Recreation. This Board first met this past November 2000, for an information-sharing meeting on IORT. A second meeting is scheduled for Spring 2001, when board members will share their agency needs with respect to IORT. In addition, consulting activities have occurred with the Utah Division of Wildlife Resources Nature Tourism Program Coordinator and Wildlife Planning Manager, the Director and Research Coordinator of the Utah Division of Travel Development, the Director and Board of the Utah Division of Parks and Recreation, the Utah State Coordinator for the National Park Service, and the USDA Forest Service Wasatch-Cache National Forest. Other relationships have been developed and cultivated with a variety of groups mentioned previously including Canyonlands Field Institute, Great Salt Lake Bird Festival, and Bear River Heritage Area Council. Additionally, IORT hosted the Western Association of Recreation Researchers and Professionals Conference (25 participants) at the Bear Lake Training Center (September 28-October 1, 2000), a coalition of recreation research scientists and faculty, along with graduate students, representing Colorado State University, University of Montana, University of Idaho, Utah State University, USDA Forest Service Rocky Mountain Research Station, and Aldo Leopold Wilderness Research Institute. IORT was also one of the sponsors of the 8th International Symposium on Society and Resource Management, an interdisciplinary symposium dedicated to the study of sustainable relationships between natural resources and society, held at Western Washington University, Bellingham, Washington, from June 17-22, 2000. The Director of IORT, also was invited to do a keynote presentation on Sustainable Tourism Development: Is achieving balance an impossible dream? for the Rural Economic Development Through Tourism (REDTT) Annual Meeting 2000, in Socorro, New Mexico. The REDTT Project is sponsored by the Cooperative Extension Service at New Mexico State University.

(5) Collaborating with other Extension specialists, presentations on four different occasions were made with Karen Biers, Extension Specialist in Entrepreneurship/Home-Based Business & Clothing/Textiles. These presentations focused on potential opportunities in tourism development in the areas of agriculture, outdoor recreation, nature tourism, and heritage tourism. The specialist also participated in an initial meeting of Extension specialists this past November, whose work is broadly focused in the area of community economic development. The purpose of the meeting was to identify potential areas for future collaborations.

(6) Conducting a research project assessing the role of tourism and tourism-related development in selected rural counties in Utah, funding was received through a New Faculty Research Grant Award for FY 2000-2001 for project titled "A Qualitative Assessment of Rural Influential: Perceptions of and Attitudes Toward Tourism and Tourism Development in Selected Rural Counties in Utah." The project is designed to examine to what extent rural influential or leaders in selected rural counties in Utah perceive tourism and tourism development playing a role in current economic activity, impacting the local society and natural environment, and affecting the future vitality of the communities and

residents in their county. Initial research has been conducted in San Juan County, and although ongoing and not complete at the time of this writing, San Juan County Economic Development and Traveler Services has requested a presentation of the findings to professional staff and board members, and also requested further consultation in relation to potential tourism development initiatives and projects in the county. Hopefully, with additional funding and resources, the scope of this project will expand to include other rural counties in the state.

Source of Funds: State

Scope of Impact: State specific.

Key Theme - Water Quality

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Utah Stream Team: A Flagship Program

Brief Description: Utah Stream Team is a volunteer stream monitoring program available to any interested group in the state. Educational materials developed for this program target grades 5 through 12. Participants learn how natural watersheds function, how human activities might impact water quality, and how to interpret their results. An easy-to-use manual provides accurate but easy to assimilate information on each of the measurements (chemical, physical or biological properties of streams), in addition to background information on watershed functions and water quality issues in Utah. Training, monitoring kits, web page support and additional contacts are all available from Extension and other locations provided by a growing network of participants.

Impacts: The program was still in development until late summer, 2000. During this development phase, however, we have trained 10 teachers; distributed 40 Utah Stream Team manuals, and established UST monitoring programs in 10 schools throughout the state. We will soon post the entire UST manual on our web site (www.ext.usu.edu/natres/wq). We have presented the program through posters at the Natural Resources Extension meetings in Lake Tahoe, and through presentations at the National Volunteer Monitoring Conference in Austin, Texas, and the Utah Society of Environmental Education Meetings in Salt Lake City, Utah. We are partnering with the Utah Division of Wildlife Resources, Utah Dept. of Agriculture and Food, Utah Division of Water Quality, Stokes Nature Center, and other organizations. Changes are being made in teacher awareness and educational programming to integrate watershed issues and water quality into their lesson plans. Increased awareness of youth on water quality issues and how our activities within watershed influence water quality.

Source of Funds: CSREES Water Quality Initiative funding, EPA 319 statewide I&E funding, state matching funds.

Scope of Impacts: State specific

Bear River Watershed Education Project

Brief Description: This watershed based monitoring program targets schools in the Bear River watershed. Participating classrooms monitor the Bear River or a tributary, using a standard protocol. They are provided UST materials to help interpret their data. They communicate with other schools in the basin through a web page and post their data on an on-line database (www.ext.usu.edu/bearrivered). We also provide the classrooms with professional mentor contacts and help with their monitoring activities. The program is interdisciplinary in its approach, and encourages classrooms to take on water quality or stream protection service projects.

Impacts: Nineteen schools with over 600 students are participating, extending from Evanston, Wyoming, to the Bear River Bird Refuge near Brigham City, Utah. Program includes:

* Service projects (tree plantings) and student presentations.
* A watershed-based prototype for use in other watersheds throughout Utah. This includes the database, which is being expanded to include all Utah watersheds.

* Changes in teacher awareness and educational programming to integrate watershed issues and water quality into lesson plans.
* Increased awareness of youth on water quality issues and how our activities within watershed influence water quality.

Source of Funds: EPA 319 statewide I&E, EPA Environmental Education Grant, CSREES Water Quality Initiative funds, state matching funds (salary).

Scope of Impact: Regional UT, ID, WY

Statewide Nonpoint Conference

Brief Description: Utah's annual Nonpoint Source Conference was held in July in Logan. The conference included two days of keynote talks and break out sessions focused primarily on animal feeding operation and storm water runoff issues. A third day offered two tours: one was a float trip on a section of the Bear River, highlighting some water quality concerns, but also the beauty of this river. A second tour highlighted research activities at USU, and included the UWRL on-site wastewater treatment training center, dairy manure management, xeriscaping research, and macroinvertebrate analysis at the "Bug lab."

Impacts: Participants from Utah and neighboring states increased their knowledge on non-point water quality issues. Other impacts include improved networking between agencies, producers, municipal officials, academics.

Source of Funds: EPA 319, state matching funds

Scope of Impact: Statewide

Water Quality Improvement Through Confined Animal Feeding Operations Programs

Brief Description: USU Extension has been an active participant in the statewide effort to develop and implement a Utah Strategy for Animal Feeding Operations. As part of this effort, a series of workshops was offered throughout the state to introduce producers to the changing regulations concerning animal feeding operations, to help them begin assessing their own operations for risk to water quality and to provide information on developing nutrient management plans. The workshops were conducted in partnership with the Utah Association of Conservation districts, NRCS, and the Utah Farm Bureau.

Impacts: Thirteen workshops were held throughout Utah, reaching more than 250 participants. A brochure on Utah's Strategy, produced with significant inputs from Koenig and other USU specialists (Mesner, Harrison) has been distributed widely throughout the state. The Utah Farm A Syst assessment materials and fact sheets on manure management developed by the water quality program were incorporated into the workshops and are being distributed to help evaluate risk to water quality from animal feeding operations. A second brochure, specifically addressing nutrient management planning, is in production, with significant inputs by Koenig and additional help from other Extension specialists (Mesner, Harrison). Farms adopting best management practices have resulted in a reduction of nutrients, salts, sediments and other pollutants statewide through implementation of best management practices and nutrient management plans.

Source of Funds: EPA 319, CSREES Water Quality Initiative Funds, CSREES Farm*A*Syst grant, EQIP I&E funds, state matching funds

Scope of Impact: Statewide

Student Water Quality Outreach Programs

Brief Description: Water quality related activities for students of all ages continue to be developed and delivered throughout the state. In-service and pre-service teacher training also continue to be offered. This past year, we continued with our 4-H summer camp program, demonstrations at county fairs, and help with school conservation or water field days. We've also begun reaching out to older students, through the Utah Envirothon, the national RC&D Youth Summit in Ogden, and increasing numbers of high schools involved in stream monitoring.

Impacts: Ninety-three teachers trained on use of water quality educational materials. Over 3680 students were reached through educational and other outreach activities. Changes in teacher awareness and educational programming to integrate watershed issues and water quality into lesson plans occurred. There was increased awareness of youth on water quality issues and how our activities within watershed influence water quality.

Source of Funds: EPA 319 statewide I&E, CSREES Water Quality Initiative Funds, state matching funds.

Impacts: Statewide

Targeted Presentations to Promote Water Quality Programs

Brief Description: To inform the public and other professionals about the water quality program, presentations were given at several statewide and national meetings. These presentations include:

* Nancy Mesner presented a poster at the Natural Resources Extension Meetings (NREM) in Lake Tahoe which discussed the breadth and depth of Utah's water quality Extension program.
* John Geiger presented a poster at the NREM meetings on the Utah Stream Team.
* Robes Parrish presented a poster on the Bear River Watershed Education Project. The posters were well received, and the meeting resulted in many contacts nationwide, especially concerning the volunteer monitoring activities.
* Nancy Mesner gave a talk at the National Volunteer Monitoring Conference in Austin, Texas about the Bear River Watershed Education Project. This meeting resulted in many useful contacts on volunteer monitoring techniques, program development, and promotion of integrated studies through volunteer monitoring.
* Nancy Mesner gave a talk and a workshop at the Utah Society of Environmental Educators annual meeting on volunteer monitoring activities.
* Nancy Mesner gave a slide presentation on stormwater water quality issues and best management practices was presented at the League of Cities and Towns in Salt Lake City and the Utah Floodplain Management meetings in Logan, Utah.

Impacts: Elements of the water quality program made available to various audiences throughout the state and country. The posters were well received, and the NREM meeting resulted in many contacts nationwide, especially concerning the volunteer monitoring activities. The volunteer monitoring meeting resulted in many useful contacts on volunteer monitoring techniques, program development, and promotion of integrated studies through volunteer monitoring.

Source of Funds: EPA 319 statewide I&E, CSREES Water Quality Initiative funding, state matching funds.

Scope of Impact: National

Tribal Water Quality Monitoring Workshop

Brief Description: A three day workshop was presented to members of 10 different tribes in EPA's Region 8 on how to develop and implement a water quality monitoring program. The workshop, held in Turtle Mountain, North Dakota, was taught by a team of USU faculty and by representatives from a Native American owned consulting firm in Montana. We hope to offer additional workshops on physical habitat monitoring and lake monitoring to further support high quality monitoring and reporting on Indian lands.

Impacts: Improved monitoring of water quality on tribal lands and improved collaboration and communication between EPA and tribes in Region 8.

Source of Funds: EPA 1043b funds

Scope of Impact: Regional, UT, MT, WY, CO, ND, SD

Watershed Planning and Water Quality Improvement Projects

Brief Description: Help with watershed planning has become an increasingly important work element for many county agents. Priority watersheds such as Chalk Creek, Otter Creek, the Little Bear River, the Jordan River and Beaver River have on-going, extremely active programs that include tours, volunteer days, monitoring activities, videos, and youth activities. Other watershed groups throughout the state are organizing, putting planning documents together and beginning to coordinate efforts to improve their upland and water resources. County agents and Extension specialists are actively involved in many of these projects.

Impacts: Below is a list of some of the Extension personnel and watershed programs throughout the state that included the following counties' involvement in watershed programs:
* Anderson - San Pete County Coordinated Resource Management Plan
* Bagley - Otter Creek Hydrologic Unit Project
* Banks - Chalk Creek Hydrologic Unit Project
* Heaton - Upper Virgin River Watershed Council
* Upper Sevier Watershed Team
* Huber - Cub River Coordinated Resource Management Plan
* Hurst - Sevier River Water Quality Work Group
* Jackson - Jordon River Watershed Council
* Johnson - Grand County Watershed Advisory Committee
* Keyes - San Juan Water Master Plan
* Kitchen - Uintah Basin Salinity Project
* Mesner - Cub River Coordinated Resource Management Plan
* Bear River Water Quality Task Force
* Nelson - Beaver Watershed Group
* Worwood - Ferron Watershed Committee

Source of Funds: EPA 319, EQIP, STATE

Scope of Impact: Statewide

Water Checks in Salt Lake Valley

Brief Description: Water audits have been conducted throughout Salt Lake valley in an effort to improve water conservation, save money for participants, and educate the public about appropriate levels of water use.

Impacts: In 1999, a total of 1,091 calls were received on the Water Check telephone line and a total of 446 residential water checks were completed around Salt Lake Valley. They reported many positive comments about how helpful the water checks were and the benefit of a landscape site assessment. An additional 286 people have requested water checks for the fall of 2000. The program will continue with FY 2000 funding, with hopes of doubling the size of the program with four trained full time auditors.

Source of Funds: State, County

Scope of Impacts: Salt Lake Valley/Wasatch Front

Key Theme - Wetlands Restoration and Protection

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Great Salt Lake Ecosystem Wetlands

Brief Description: Extension specialist completed the development of a comprehensive master education plan for the Greater Great Salt Lake Ecosystem Wetlands.

Impacts: This plan will be used to coordinate and guide public outreach efforts designed to increase Utah citizen's awareness and appreciation of wetlands and motivate them to conserve wetlands through voluntary means.

Source of Funds: Utah Mitigation and Reclamation Commission, Private conservation groups, the U.S. Fish and Wildlife Service, the Utah Office of Public Education, the S.J. and Jessie Quinney Foundation, the Utah Division of Wildlife Resources, and private citizens.

Scope of Impact: Western Hemisphere, Intermountain West

Key Theme - Wildlife Management

Wildlife Management on Private Lands

Brief Description: Extension specialists developed a comprehensive program to improve the management of wildlife and their habitats on private land in Utah. The Cooperative Wildlife Management Association Program (CWMA) constitutes an annual Extension and training sessions for private landowners and operators that participate in Utah' s Cooperative Wildlife Management Unit (CWMU) program. The CWMA is a 501 c (6) non-profit business organization incorporated under the laws of the State of Utah. CWMA members pay an annual $100 membership fee. These fees are used by Extension specialists to conduct two annual meetings and workshops on topics of interest to program participants and to maintain periodic correspondence.

Impacts: In 2000, the CWMA had 64 CWMUs as members. These units consisted of over 300 private ranches totaling over 1.7 million acres of private rangelands in Utah. Since inception of the CWMA, the program has saved Utah CWMU operators over $4.5 million dollars and resulted in improved habitat and range conditions on over 300,000 acres.

Source of Funds - State wildlife agency, private landowners, and the S.J. and Jessie Quinney Foundation.

Impacts: In addition to Utah, Extension specialists have made presentations on the program in Nebraska, North Dakota, and South Dakota and presented a paper at a recent North American Wildlife and Natural Resources Conferences that was held in Washington, D.C.

Wildlife Habitat Enhancement

Brief Description: Extension specialists worked within the Utah Grazing Land Conservation Initiative (GLCI) coalition to integrate wildlife management more fully into the scope of the Utah GLCI Strategic Plan. Of 12 private rangeland and pasture demonstration projects sponsored by the Coalition, five were focused on enhancing upland and riparian wildlife habitat through fencing, water development and vegetation manipulation. These demonstrations formed the basis for posters and presentations at producer meetings throughout the State. Cooperating Organizations: Utah Farm Bureau Federation, Utah Cattlemen's Association, Utah Wool Growers Association, Utah Farmers' Union, Utah Association of Conservation Districts, Natural Resources Conservation Service, Utah Department of Agriculture and Food, Utah Division of Wildlife Resources, Utah State University Extension, U.S. Forest Service, Bridgerland Applied Technology Center, Utah Section of the Society for Range Management, USDA Agricultural Research Service Forage & Range Research Lab.

Impacts: More than 750 people attended these meetings and were introduced to programs and opportunities for improving wildlife habitat on private lands.

Source of Funds: Utah GLCI funds

Scope of Impact - State Specific

" \l 3**Utah Agricultural Experiment Station**

Key Theme: Other - Intensive Pasture Management and Use

Pasture Development, Reclamation and Quality

Brief Description: The productivity of grazing lands that are currently being used by livestock operators that is not intensively grazed is being examined. The production of livestock and ecological status of three grazing systems are under study including rest-rotation, deferred-rotation, and season-long grazing. (The interaction between livestock and elk populations are also being examined as part of this study.) Work has been completed in identifying the seasonal distribution of dry matter forage production and its nutritive value under simulated pasture grazing. Conditions necessary for successful pasture grazing have been identified and the efficacy of intensive pasture rotation management for dairy heifers is under study. Finally, the responses of perennial forages to weather conditions and varying irrigation and fertility levels are being identified.

Impacts: The seasonal distribution of dry matter production has been identified following three years of study and those grasses and grass/legume mixtures adapted to intensive rotational grazing have been identified. A comprehensive guide for the management and use of small irrigated pastures has been developed. This is directed primarily at the small pasture owner. It has been demonstrated that dairy heifers can be efficiently grazed under an intensive pasture management scheme, even following lactating dairy cows, suggesting additional benefits for intensive pasture utilization under irrigation. Finally, water use for intensively managed pastures has been found to be quite different from that of traditional row crop production. Water is needed more often, though in lesser amounts and must be available upon demand or rotated such that it does not become a limiting factor. The actual dollar savings have not been completely identified as of yet for beef cattle operators or dairy cattle operators.

Source of Funds: Hatch Act

Utah (UTA) CRIS Project Numbers:

008	331	418
173	336	797

Funding Level: $1,120,333 **FTE:** 2.0

Scope of Impact: Intermountain West

Key Theme: Natural Resource Management

Planned Program Area: Human, Wildlife, and Domestic Livestock Interactions and Compatibility

Brief Description: The feedback effects of global warming upon forest carbon flux is being modeled. A set of molecular tools for quantifying ammonia oxidizing bacteria is being developed. The interactions of microbial nitrogen transformations with nitrogen uptake and fixation by alfalfa and the effect of supplemental nitrogen from animal wastes are under study, as are the nutrient flows through crop, forage conservation, feeding, animal, and manure components for a dairy production system. Researchers are attempting to evaluate the effects of biosolids applied at agronomic rates and at sub-agronomic rates in combination with organic fertilizer on forage yield, mineral content, and feed quality. Attempts are underway to reduce the excess urinary nitrogen excretion by lactating dairy cows through a reduction of excess nutrient loading. Dairy production systems, with a minimum environmental impact, are being developed. More

general work in the area of ecosystem management principles is also underway. The current status of open space, development pressure, and protection efforts in Utah and the surrounding states is being identified, with impacts of each condition being estimated. Methods of reducing agricultural problems caused by avian and small mammalian herbivores are being developed through the use of grasses infected with fungus. Different big game hunting regimes are being examined in relation to accidental mortality on herd composition. The Western SARE program is headquartered at Utah State University. Methods of affordable remote sensing-based approach to rangeland monitoring are being developed, as are the use of beef cattle as a means of dispersing seed to revegetate and improve degraded rangelands in the Intermountain West. A monitoring program is being developed which would help land managers and land owners determine if they are meeting grazing, wildlife, and recreation management objectives on a particular area. The dynamics of the Great Basin pinyon-juniper ecosystem are being examined. Finally, probable causes of nitrate contamination in Sanpete County are being identified, as are associated formal management strategies to be used in addressing water quality problems.

Impacts: Most of this work is not at a stage of completion where specific impacts can be reported. Some of the work is very basic in nature, i.e., the development of principles for ecosystem management. Other work is highly applied in nature, e.g., the relationship between hunting and accidental big game mortality.

Source of Federal Funds: Hatch Act

Utah (UTA) CRIS Project Numbers:

010	550	881
275	704	905
323	709	910
332	726	911
338	828	912
416	832	941
449		

Funding Level: $1,076,545 **FTE:** 3.5

Scope of Impact: Intermountain West, National, and International

Goal 5: Enhanced economic opportunity and quality of life for Americans.

Overview

Extension Results Supported with Formula Funds

Results reported under Goal 5 using formula funds are those associated with some Native American projects and 4-H programs. The remaining projects were supported by state funds.

Among the major accomplishments associated with Native American programs are:
* 16 weavers learned about the history of their craft and how to identify wool types that are suited to the hand weaving process.
* 24 Native American families learned better ways to store food without refrigeration and how to keep it safe and sanitary in the absence of running water.
* Over 200 clientele received information on eating healthy and preventing and managing diabetes.
* Eleven Native American families saved $1500 each by have supplemental grazing for their livestock in an area that had been reseeded in cooperation with Extension staff.

Among the major accomplishments associated with 4H programs are:
* A combined group of 4-H and Utah Youth City Council members participated in a Mock Legislature at the state capital where an understanding of how the state legislature works was achieved.
* Utah has 72 youth and 22 adult mentors from 10 counties involved in the Ambassadors program who are involved in leadership development and service.
* Five teen councils are currently using the 4-H workforce preparation guide for grades K-6.
* Master Your Future, a program teaching financial responsibility for high school, is being used throughout the state and generating excitement among youth in the state.
* Student test scores on agricultural literacy associated with Ag in the Classroom increased from 66.4% to 87% in one county.

Most of the projects conducted under Goal 5 are financially supported using state funds. Some of the accomplishments of these projects include:
* An Extension faculty who developed PowerPay estimates that estimated savings in interest reported in 244 completed surveys of businesses and the military that used the program is $41 million dollars.
* Over 400 persons adopted a significant financial management practice as a result of financial management workshops.
* In Utah, 214 participants in the Money2000 program increased their savings by at least 10 percent.
* As a result of business retention and expansion programs, 35 businesses implemented improved business practices.
* Sixteen people developed and adopted business plans as a result of the Home Based Business program.
* Nine communities developed master plans through Utah's community development efforts. Utah Extension assisted 24 communities with their planning and physical designs.
* Faculty assisted 11 communities to establish goals and objectives related to attracting new industry or expanding existing businesses.
* The Youth and Families with Promise program, as reported by parents, was responsible for increasing the confidence by 64 percent among youth participants, and increased the perception that doing well in school by 55 percent. It also reported that 100 percent of parents would recommend the program to others.

State Assessment: The programs offered within Goal 5 address critical issues in Utah. Extension faculty on campus and in the counties are responding very well to local and state-wide needs. The impacts reported here reflect a very successful program of work. They also reflect the beginning of the five-year plan. We expect that we will need to change some of the goals and indicators set at the beginning of the five-year plan because of the dynamic nature of our economy, our population, and changes in our environment.

Total Expenditures and FTE:
Smith-Lever $702,675
State Match $694,079
FTE 24.2
" \l 3**UTAH EXTENSION SERVICE**

Key Theme - Promoting Business Programs

Business Retention and Expansion

Brief Description. Extension Specialists, working with state of Utah Economic Development staff, county economic development professionals and local Extension staff are assisting communities in organizing steering committees, in preparing visitation surveys, in collecting information from existing business firms, and analyzing and reporting survey results to community and business leaders. Four staff worked with communities to help them adopt business retention and expansion strategies. Three staff worked with business owners to help them implement improved business practices. Two offices received requests from businesses for assistance with expansion and retaining efforts. Fourteen businesses requested assistance with expansion and retaining efforts. The following key program components were utilized in business retention and expansion work:

Assisted with organizing local steering committee
Assisted with visitation surveys
Assisted with collecting information from existing business firms
Assisted in analyzing and reporting survey results to community and business leaders

Impacts: Clark Israelsen, Cache County Agricultural Agent, is working with 12 farm operations that are attempting to expand their business to sufficient size to make it financially possible to include the next generation in the operation of these farms. This will allow the family business to continue for another generation and also generate additional income for family living expenses. He assisted eight farm families in organizing financial statements sufficient to qualify for FSA loan guarantees and is coordinating efforts of lending institutions and Extension to train producers in the proper use of financial statements. One community adopted business and retention expansion strategies. Thirty-five businesses implemented improved business practices. Collaborative efforts included:

Checked food labeling compliance
Survey information about stored grain pests and problems for new Malt-o-meal plant.

The NASA Geospatial program collaborates with concurrent programs in Arizona and Mississippi. Workshops were attended by faculty from MT, CO, OR, CA, and WA.
Worked with Extension and state specialists in developing and applying retention and expansion model.

Two staff reported their work in business retention and expansion involved integrated research activities. Examples included: Agencies: NASA, USDA-ARS, USDA-NRCS, & BLM. Worked with state Extension specialists and agencies in applying target industry models to retention and expansion projects.

Source of Funds: State of Utah

Scope of Impact: Multi-state Extension - With CO, NM, AZ, NV, CA, WA, ID, WY, MT, OK

Key Theme - Home-based Business Education

Home Based Business Development

Brief Description: Extension specialists in cooperation with county faculty and economic development professionals provide educational programs directed toward improving and enhancing local business development through home occupations. Sources of local capital, development of business plans, risk assessment, and community support are educational resources made available to entrepreneurs and other potential customers during workshops and conferences.

Impacts: Karen Biers, Extension specialist, conducted a series of home-based business seminars in four rural counties. These seminars focused on risk management and marketing issues. Five of the participants requested individual consultations related to marketing issues. These seminars were presented as a cooperative effort between Extension and economic development agencies in the counties. Participants in the web-based marketing sessions reported they better

understood web page attributes that impact consumer spending and one participant indicated that she was going to redesign her web page. Participants indicated that they were interested in sessions dealing with business management. All but one of the participants attending indicated that they were going to start a business. Six staff reported helping people complete the home based business development program. Sixty-eight people completed the home based business development program. Four staff reported working with people to develop and adopt a business plan. Sixteen people developed and adopted a business plan. One person was successful in achieving at least one business goal. The following key program components were utilized in business retention and expansion work:

*Used existing home-based business educational programs
*Face to face presentations
*Online presentations
*Other (work one on one)

None of the home based business projects involved collaborative efforts with other states.

Source of Funds: State of Utah

Scope of Impact: State specific

Key Theme - Home Based Business

Native American

Brief Description: A multi-media presentation was given to a group of Navajo weavers.

Impacts: Sixteen weavers learned about the history of their craft, and how to identify wool types that are suited to the hand weaving process.

Source of Funding: USDA formula funding and State of Utah

Scope of Impact: Multi-state (Utah, Arizona)

Key Theme - Community Development

Community Organization and Leadership Development

Brief Description: An Extension specialist in cooperation with county faculty conduct workshops that educate local officials and community leaders in skills of organizing, maintaining, and evaluating local groups and organizations. Included in this training are skills related to the recruitment, training, motivation, and rewarding of volunteers important to the operation of rural communities. Another component of this effort is assisting leaders in conducting community needs assessment surveys important in identifying community needs and preferences associated with setting goals and priorities.

Impacts: Stan Guy, area agent, worked with local elected officials, city staff, economic development boards, and county agents in developing three public opinion surveys that addressed a variety of planning, operational, and policy issues facing elected officials. Community surveys were sponsored by the Glendale Community Council, Salina City, and Farmington City. Planning issues, government services, commercial development, recreation, and community services were addressed in these community surveys. Opinions from 935 citizens were gathered on public issues that affect their quality of life. As a result of the surveys, elected officials incorporated public priorities in deciding on the days and hours of operation of a public swimming pool, the public preferences for downtown revitalization and the types of commercial development preferred in Salina, and the Glendale Community Center Board in Salt Lake City obtained a data base of community needs and volunteers that were called upon to refurbish the Glendale Community Center and offer programs and services for this low income community. Stan Guy and David Rogers, Extension specialists, contracted with Logan City to conduct a telephone survey on the amount of underemployment in the county.

A random sample of 510 county residents provided information on underemployment, factors associated with it, and methods that can be used to more fully involve underemployed residents in the labor market and can be used in planning for attraction of additional high-tech businesses to Cache Valley. Survey results are being used in planning for the attraction of additional high-tech businesses to Cache Valley. Half of the staff reported doing community needs assessments. Sixteen communities were assisted with needs assessments. Nine communities developed master plans. Four communities were assisted in developing master plans.

Source of Funds: State of Utah

Scope of Impact: State specific

Key Theme - Leadership Training and Development

Community Organization and Leadership Development

Brief Description: Youth leadership development is a central focus in the Youth City Council Program sponsored and supported in part by Extension specialists and county faculty. Annual conferences are held on the USU conference and attended by 300-400 youth who have been elected to youth city governments that parallel adult city governments in approximately 90 communities throughout the state. In between the annual conferences youth work with local advisors and are taught leadership skills through experiential learning.

Impacts: Under the direction of Stan Guy, Area Agent, Utah State University Extension cosponsored the 17th Annual Youth City Council Leadership Institute at USU on March 23-25, 2000. Thirty-three Youth City Councils from throughout Utah comprising 432 youth and advisors participated in the three-day conference. They learned leadership, communication, organizing, social, and self esteem skills and about youth courts, time management, and other topics associated with being a youth mayor, council member, and Youth City Council participant. A majority of participants completed an evaluation of the Leadership Institute. Ninety-eight percent (98%) of these participants indicated they plan to adopt one or more recommended practices taught at the leadership institute. In addition, 72% rated the overall conference as "Excellent" and 26% rated it as "good." The youth councils provide many hours of service that benefit their communities. Organizational ideas, raising funds, gang prevention, and other aspects of Youth City Councils strengthen communities throughout Utah. Five faculty reported their work with community organization and leadership involved providing workshops in community leadership skills. There were a total of 557 citizens who participated in workshops that provided leadership skills. Half of the leadership workshops and conferences were geared toward youth increasing their leadership skills. 792 youth increased their leadership skills.
Work with community organization and leadership involved the following:
* Family Community Leadership (FCL) materials, Youth City Councils
* Other (list Caring Adult/mentoring and Conference Committees; Private Grazing landowners, Tourism, Youth Summit, Teen Councils)

Source of Funds: State of Utah

Scope of Impact: State specific

Key Theme - Community Development

Community Planning and Development

Brief Description: Extension specialists in cooperation with county faculty work with local community officials and leaders in identifying major areas of planning need and design. Attention is given to designing community entrances, parks, public areas, sidewalks, streets, etc., and developing master plans, subdivision ordinances, and options for maintaining the health, welfare and safety of local communities.

Impacts: David Bell, Extension specialist, conducted a planning exercise for future growth and privatization for Dutch John, Utah. After privatization occurred, the city asked for David's planning maps in digital form so they could use them for future planning and design. The planning maps are now being used by the community for making planning decisions for future growth and development. David Bell prepared a plan for refinements for Main Street lighting and for some landscape areas in Escalante, Utah. Much of the streetscape has been installed and the new lights have been ordered and will be installed later this year. A final draft has been completed for the Western Regional Growth Management Tool Kit. David Rogers assembled the narrative for the document and David Bell provided graphics and photographs and did the report layout. Information was presented to a group of growth management planners and will be assembled for use in Western Region Workshops. Three faculty members reported that their work with community planning and design involved community planning or physical designs. Twenty-four communities were assisted with community planning or physical designs. Four faculty members reported that their work involved educational workshops with community decision makers directed toward comprehensive plans. Ten communities were assisted in developing comprehensive plans. Five faculty members reported that their work with community planning and design involved providing training on growth management tools. Two communities received training on growth management tools Work with community organization and leadership involved the following: Planning charets, visioning workshops, surveys:

* Work with community planning and design involved collaborative efforts with the following states: AZ, WA, ID, MT.
* The Growth Management Project funded by the Murdoch Foundation, Western Rural Development Center, Farm Foundation, and USU involves Utah and Montana. This project seeks to provide information about existing tools and programs.
* The NASA Geospatial Extension Program provided imagery to several counties (through Jody Gale) for planning.

Four faculty members reported their work in community planning and design involved integrated research activities.

* Worked with Dick Toth and Dave Bell in LAEP on modeling futures alternatives for Cub River Watershed
* NASA, USDA-NRCS, USDA-ARS all have participated in the NASA Geospatial Extension Program
* Working with local elected officials, city staff, economic development boards, and county agents the USU Extension Community Development educator developed three public opinion surveys that addressed a variety of planning, operational, and policy issues.

Planning projects that are adjacent to, or within public lands involve collaboration with appropriate public agencies. For example: BLM, U.S. Forest Service, U.S. Parks Service, State Parks, State Fish & Wildlife, State Natural Resources, USU College of Natural Resources.

Source of Funds: State of Utah

Scope of Impact: State specific

Key Theme - Jobs and Employment

Economic Development Planning

Brief Description: Extension specialists working with county faculty, economic development professionals, and state business development staff work with local community leaders and officials to create, through educational programs, expanded employment opportunities, through changes in the industry mix and capital availability. This is accomplished by strengthening community networks, local business infrastructure, capacity for building local opportunities or attracting new businesses from outside.

Impacts: The National Scenic Byways Web Site funded by the U.S. Department of Transportation is providing information world-wide about Scenic Byways in the U.S. Among these byways are several in Utah that are benefiting economically from increased exposure to a world-wide audience. At present, this site is receiving 2,000,000 hits/month. This effort is organized and maintained by Steve Clyde, Computer Science, and David Rogers, Extension specialist. Verl Bagley, County Extension faculty in Wayne County, assisted owners of a new start-up business, one that constructs ATV camper trailers, with Internet searches for supplies and paint and finish processes. He also helped to keep the local banker apprised of the business' progress and needs. A freelance writer was also requested to spend a day

with Verl and business owners on the Piute Trail. A meal was served on the trail using the trailer, which converts into a picnic table, sink, cook stove and grill. The writer agreed to run an article about small home based business owners in Piute and Wayne Counties in the spring. Five faculty reported their work in economic development involved helping communities to set economic development goals to improve their competitive economic position. Three communities were worked with to help them set economic development goals. Three faculty members worked with communities in preparing to establish goals and objectives related to attracting new industry or for expanding existing businesses. Faculty worked with 11 communities to help them establish goals and objectives related to attracting new industry or for expanding existing businesses. Four faculty members helped communities have better information about themselves and be able to proceed with developing economic development plans. Fourteen communities were worked with to help them have better information about themselves so they were better able to proceed with developing economic development plans. Four faculty members reported their work in economic development involved preparing communities to implement business incubators. One community was helped to prepare to implement business incubators. Worked with relevant state and county economic development agencies. Participated as a member of economic development team that approached community and business leaders to determine their interest in working with the partnership. Responded to requests from communities independent of problem analysis done by partners. Collaborated on appropriate target industry and tourist development models. Three faculty reported their work in economic development involved integrated research activities. Working with Utah Small Cities, Inc. whose members are Economic Development professionals from cities and towns throughout rural Utah, USU Extension has developed a questionnaire to be given to Wasatch Front businesses. The survey seeks urban business. Utilized IMPLAN Input-Output model in projecting economic impacts of various business scenarios. Worked with state specialists and agencies on target industry and business retention and expansion models and applications.

Source of Funding: State of Utah

Scope of Impact: Multistate Extension - With NM, NV, MT, OK, and other Countries: Hungary, Poland

Key Theme - Supplemental Income Strategies

Native American

Brief Description: Mental Health Day Treatment Centers worked with Extension to provide arts and crafts workshops for Native Americans.

Impacts: Mental patients were able to learn new skills through the manipulation of media, such as clay, string, fabric, etc. They also learned to use sewing machines.

Source of Funding: State of Utah

Scope of Impact: State Specific

Key Theme - Children, Youth and Families at Risk

Brief Description: The Navajo Extension Partnership provided a conference for Native Americans in the Four Corners Region called, "Strengthening the Native American Family for the New Millennium."

Impacts: The conference had a participation of 250 people. Most participated in agriculture related topics, with 20 participating in family related workshops.

Source of Funding: State of Utah

Scope of Impact: Multi-state

Key Theme - Home Safety

Native American

Brief Description: Family nutrition workshops addressed food safety issues for those without electricity and running water.

Impacts: Twenty-four Native American families learned better ways to store food without refrigeration and how to keep it safe and sanitary without running water.

Source of Funding: State of Utah

Scope of Impact: State specific

Key Theme - Other

Native American

Brief Description: Workshops and a monthly newsletter provided information on healthy eating and diabetes prevention and control.

Impacts: Over 200 clientele received information on eating healthy and preventing and managing diabetes.

Source of Funding: State of Utah

Scope of Impact: State specific

Key Theme - Agricultural Financial Management

Native American

Brief Description: Information seminar presented basic farm and ranch record keeping to Native Americans.

Impacts: Twenty-eight Native Americans learned the basic principles of farm and ranch record keeping.

Source of Funding: USDA Formula Funds and State of Utah Funds

Scope of Impact: Multi-state Extension - With UT, AZ

Native American

Brief Description: Agronomic recommendations were made for two Native American farmers.

Impacts: Two Native American farmers saved $8,000 in production costs.

Source of Funding: USDA Formula Funds and State of Utah Funds

Scope of Impact: Multi-state Extension - With UT, AZ

Native American

Brief Description: Provided information to the Ute Tribal Farm, twenty noxious weed field guides for Utah, small grain variety bulletins, endangered and threatened plants of Uintah and Duchesne Counties, Opportunities to benefit from the Loan Deficiency Program, and weed control recommendations.

Impacts: The Ute Tribal Farm increased profitability by $2142 on barley production.

Source of Funding: USDA Formula Funds and State of Utah Funds

Impacts: Multi-state Extension - With UT, AZ

Native American

Brief Description: A plan was developed by Extension personnel to obtain grant money and reseed a burned out grazing area.

Impacts: Eleven Native American families saved $1500 each by having supplemental grazing for their livestock in an area that had been reseeded.

Source of Funding: USDA Formula Funds and State of Utah Funds

Impacts: Multi-state Extension - with UT, AZ

Native American

Brief Description: Extension personnel developed a grant proposal for Native American Cattlemen to set up an Internet marketing system for purebred livestock.

Impacts: Native American cattleman can improve their farm income by marketing on the Internet.

Source of Funding: USDA Formula Funds and State of Utah Funds

Impacts: Multi-state Extension - with UT, AZ

Key Theme - Farm Safety

Native American

Brief Description: A livestock management safety program was held for Native American Ranchers.

Impacts: Twenty-six Native American Ranchers learned about safety procedures for handling livestock.

Source of Funding: Utah

Impacts: State Specific

Key Theme - Family Financial Management

Retirement Planning, Estate Planning, Consumer Management, Family Resource Management

Brief Description: Barbara Rowe provided training on banking and credit, debt reduction, investing on a budget, and retirement planning in Millard, Beaver, Carbon, and Morgan counties. At the request of the agents, she re-wrote the successful Women's Financial Information Program into a six-unit workbook that will be complete with interactive worksheets and PowerPoint slides for each unit. A committee of agents read each draft (as well as specialists at Purdue and Oregon State University) and an attorney read the unit on probate, wills and advance directives. She provided satellite training on the new material in November (2000) and face-to-face in-service training in February (2001). She also compiled a Power Point program on Consumer Fraud, on financial services available on the Internet and written three fact sheets which are on the web: Ponzi Schemes, Pyramid Schemes and Withdrawals from an Individual Retirement Account. The first two fact sheets accompany the fraud program, the last was written at the request of an agent and delivered to two Financial Planning for Women workshops at the Family Life Center.

Impacts (short term): Agents now have more tools that they can use with their local clientele. Seventy-five percent of the agents report that they have worked with "Take Charge of Your Money" and/or PowerPay. The agent who helped develop PowerPay reports that the estimated savings in interest reported by 244 surveys returned from Extension, businesses that have used the program and the military is $41 million dollars. Agents report that 3,457 people in their counties were involved in financial management workshops last year and 441 adopted a significant practice as a result of taking the workshops. Barbara also serves as state and national coordinator of the national Money2000 program. In the last six months of the year 2000, 29 states reported increased savings of $10,618,271 (cumulative) and $8,247,219 in decreased debt (cumulative). About half of the 29 states that have been in the program since 1995 will be continuing with programming in Money2000 past the year 2000. In Utah, 214 workshop participants reduced their credit debt by at least 20%. One hundred percent of the Utah participants in Money2000 increased savings by at least 10%.

Source of Funding: Smith-Lever

Impacts: Multi-state except for bankruptcy research - With NM, CA, WA, ID, OR, WY, MT, IN, NY, and NJ.

Key Theme - Financial Management for Youth

Family Financial Management

Brief Description: Barbara Rowe serves as state coordinator of LifeSmarts, a game-show contest for high school students. In 2000, we held state 4-H contests on campus in July and four teams competed. However, we had only four teams register for the state contest, to be held in February 2001. Because of the lack of participation, our largest contributor eliminated funds for the program from their budget and so Utah will not be a participating state this year. We are in negotiations with the Better Business Bureau to take over the contest. A large part of the reason for the low number of student participation seems to be the qualifying quizzes that are now only available on the Internet. According to the national coordinator, this is consistent with the findings of other states. Barbara also serves as state coordinator of the High School Financial Planning Program. This program is for high school teachers who use the seven-part curriculum in financial management as part of their high school classes Where in the past, the state specialist has traveled to different areas to train the teachers who use the curriculum, teachers can now log into the Internet and take the training there.

Impacts: For the years 1999-2000, 33 teachers in the state used HSFPP (25 of them new users). Thirty-one new schools said they were using HSFPP in their classes, (12 new) and the number of students taught was estimated at 3988. In 2001, the Certified Planning Student Association decided to take HSFPP on as a service project, and were trained by the state specialist.

Source of Funding: $1,000 from the National Endowment for Financial Education and state funding

Scope of Impact: Multi-state Extension - With CO, MT

Key Theme: Children, Youth, and Families at Risk

Youth and Families with Promise

Brief Description: Utah's Youth and Families with Promise Program (YFP) is a two-level mentoring program (young-adult individual mentors and grandparent-age mentor couples) designed to prevent youth problems through early intervention with at-risk youth, ages 10-14, and their families. Youth are in both rural and urban areas, primarily on free and reduced lunch, with 65% living in single parent families. Youth referrals come from school administrators, Juvenile Courts, community and religious organizations, or from parents. Mentors are recruited from local communities to establish caring relationships with the identified youth and his or her family. Mentors provide motivation and tutoring in reading and academic skills and participate with youth in 4-H in other structured recreation and community service activities. Youth, parents, and mentors also participate in monthly Family Night Out activities to strengthen family relationships.

Impacts: Parents, youth, mentors and teachers were surveyed using a post-then-pre design showed statistically significant improvement ($p < 0.001$) in nearly every area surveyed. In addition, focus groups held with parents and also with mentors revealed very positive impacts. Percentage of YFP youth showing improvement in selected areas as seen by their parents (n=94):

YOUTH:	% IMPROVING	%NO CHANGE	% DECREASING
thinks doing well in school is important	55.4	41.3	3.3
cares about school	57.0	35.5	7.5
finishes homework	48.9	46.7	4.3
says no if friends want to do something wrong	42.9	56.0	1.1
tries to work out problems without fighting	50.5	47.3	2.2
does not give up when things become difficult	48.4	50.5	1.1
feels confident about themselves	63.4	33.3	3.2
enjoys school	47.3	48.4	4.3
tries to do the right thing	45.2	51.6	3.3
feels close to family	42.4	54.3	3.3
respects their parents	43.0	53.8	3.3

Other parental responses:	% Yes	% No
Would you recommend the program to others	100.0	0.0
Would you participate in the program again	98.9	1.1
Felt the mentor set a positive example for their youth	95.7	4.3
Felt the mentor cared about my youth	94.6	5.4
Felt the mentor taught the youth valuable skills	94.6	5.4

Source of Funds: The program was funded from the Utah State Legislature ($100,000); USDA State Strengthening Project ($150,000); and the Utah Board on Juvenile Justice ($67,218). An appropriation from the Office of Juvenile Justice and Delinquency Prevention (OJJDP) for $1,000,000 began May 1, 2000, to expand the program into 25 sites in 22 counties.

Scope of Impact: State Specific

Key Theme - Farm Safety

Brief Description: The Extension Farm Safety program has concentrated on identifying major causes of farm accidents and directing educational efforts toward these causes. Included in these causes are animal handling and machinery operation. Educational materials (fact sheets) and workshops (in cooperation with Vocational Agriculture and Farm Bureau programs) have focused on these major causes.

Impacts: Have secured $7000 from external sources to supplement state and federal funds. 376 farmers received farm safety training. Approximately 75 small farmers were part of this group. 200 of those attending training learned how to minimize or control farm work and work site hazards and risks. 376 of those attending farm safety training improved their understanding of specific hazards. 400 youth participated in farm safety programs and 64 received hazardous occupation certification through a training course.

Source of Funds: USDA, State of Utah, other sources

Scope of Impact: Multi-state Extension - With CO

Key Theme - Youth Opportunities for Community Involvement

Brief Description: With 707,400 Utah residents age 18 and younger, Utah has the highest percentage per capita of children in the nation (Utah Kids Count Data). Utah has 102,106 youth enrolled in 4-H, being led by 8,295 adult volunteers and 1,769 teen volunteers. Recent surveys indicate that less than 20 percent of American youth under 18 have opportunities for meaningful citizenship and community participation. As potential state and national leaders, youth need opportunities to become actively involved in community affairs. Such opportunities provide first-hand experiences in problem solving and decision-making. By actively working on community issues with elected and appointed officials, youth learn to appreciate and understand their own communities. Utah 4-H has provided citizenship, leadership and community involvement opportunities through the following programs:

Impacts: Mock Legislature - 108 4-Hers took the leadership in the House of Representatives in the State Capitol Building in Salt Lake City and experienced the legislative process by presenting actual bills dealing with teens that were used in the previous legislative session. These youth participated in committee work and debated and voted on the bills in the House floor.

Guide Dogs - continued 4-H support of the citizenship Guide Dog program. We have 54 dogs in Utah and we had 226 Guide Dog participants during 4-H Day at the Utah State Fair.

Youth City Council Networking - This year a concentrated effort was made to re-involve 4-H and Youth City Councils. The 4-H program was presented to the Association of Youth City Councils as a vehicle to help their program. This collaboration has resulted in the combined group participating in Mock Legislature, and the coordination of Ribbon Week with the Youth City Councils and 4-H Teen Councils in 15 counties.

Youth Federation for Youth - 4-H State Ambassadors have been involved with the Federation, and ten counties are currently working on the statewide Ribbon Month Committee designed to stop drug and violence in our youth. This work provides us with the opportunity to collaborate with many youth serving agencies.

Teen Leadership Training (TLT) - 83 youth and 18 adult leaders attended the three-day TLT program. Workshops included creating youth/adult partnerships, team building, asset building, service learning, ambassadorships, teen council development and teen ambassador development. For the first time adults were invited to attend workshops specifically designed for them on asset building and working with teens. Montana sent 6 youth and 1 adult delegate.

Ambassadors - The current ambassador program was expanded to include District Ambassadors. Our State Ambassadors and Ambassador Advisors have been heavily involved in the expansion of the Southwest District Ambassador program. Last year we had 72 youth and 22 adult mentors involved as District Ambassadors in ten counties, an increase of 30% over the previous year. One of the main objectives of the Southwest District Ambassadors has been service.

Western Region Leadership Camp for Teens in Colorado - 30 youth and adults attended the camp in Fort Collins, CO. Leadership and community involvement were the main themes of the camp.

Adventure Camp - A statewide camp held for the first time on the USU campus for 7th and 8th graders. This camp is designed to develop leadership, citizenship and teamwork skills. Older teens and Ambassadors serve as group leaders and mentors. 38 youth and adults participated.

Bake and Take Week - 20 out of 28 counties reported Bake and Take activities during State 4-H Week. They held special programs to recognize business leaders, government officials and organizations that support 4-H.

Community Pride - 12 Chevron Community Pride Grants were awarded. This year our grant money was cut in half and we received only $2,500. 251 youth were involved in the grant process. 366 youth were trained in community service. 134 participated in awards for community pride. 298 adults were involved in the projects. 85% of our counties reported that their work directly gave youth opportunities to participate in community service projects. Utah's 4-H youth enrolled in citizenship, civic education and personal development and leadership totaled 17,875.

Source of Funds: State, Smith-Lever

Scope of Impact: Utah

Key Theme - More and Better Trained 4-H Volunteers

Brief Description: Our Utah 4-H Volunteers are making a difference in the lives of our young people. Our Extension agents cannot reach all youth without the help of volunteer leaders. In Utah, volunteer leaders are the corner stone of the 4-H Youth Development Program. At the present time we have approximately 25.15 FTE (full time equivalent) Extension agents working in 30 counties. Of those, only four agents have full time 4-H responsibilities, most have dual assignments. Our last reporting period showed 4-H had 8,295 adult volunteers and 1,769 teen volunteers. This is an average of 379 volunteer leaders per Extension agent! With 102,106 youth enrolled in 4-H projects in our state, each Extension Agent has responsibility for approximately 4,005 youth! It is the volunteer leaders who work directly with the youth and truly make a difference in their lives. The need to recruit, train and mentor both new and current volunteer leaders is a continuing one. The success of the 4-H program really depends on these volunteers.

Impacts: We have helped with the volunteer leadership program by:
* Cooperating with western states volunteer recruitment marketing campaign.
* Developing and distributing new recruitment materials for new 4-H volunteer leaders.
* Training and working with older teens to serve as 4-H leaders - Teens Reaching Youth (TRY).
* Working with Leadermete committees (a volunteer leader training program) to implement this annual statewide training for 4-H volunteers and agents.
* Working with Legislators to obtain additional funding for 4-H volunteer development.
* Working with the Utah 4-H Volunteers Association to keep their State Council organized and functioning; to publish three to four newsletters each year; to sponsor volunteer leader awards, the State 4-H Talent Show and Contests, Space Camp and events such as the Green Foods Contest and Fashion Show at the Utah State Fair.

Source of Funds: State, Smith-Lever

Scope of Impacts: Utah

Key Theme - Preparing Youth for Employable Futures

Brief Description: Young people, whether pursuing a career path in entrepreneurial ventures or seeking employment opportunities in the future, need to build core competencies and foundation skills. In the U.S., among counties with populations over 10,000 having the highest share of residents under the age of 18, 7 out of 10 are found in Utah. This alone indicates a great need for work force preparation.

Impacts: World of Work (WOW) - A 4-H CCS workforce preparation activity guide for grades K-6 has been given to 28 Utah counties. Emphasis has been given to counties to incorporate this curriculum into existing Teen Councils and District Ambassadors programs, using teens to present work force preparation activities to younger 4-H'ers. Five teen councils are currently using these materials. Counties have been supplied with additional resource material and have been encouraged to become involved in this program. Information was presented at State 4-H Contests, Teen Leadership Training (TLT) and at Western Region Teen Leadership Camp.

World of Work Contest - This year at the State 4-H Contests a world of work contest was held. Each 4-Her who entered the contest had to fill out a job application (most of the youth had never filled one out before.) They were shown a film about the world of work while waiting for their interview. They were also given handouts on job interviewing, effective cover letters, and preparing for the world of work. They went through a ten-minute mock interview. Each individual was scored on his or her interview and application. U.S. Savings Bonds or State Contest jackets were given as awards to the top individuals. 69 youth participated in the contest.

Master Your Future - We introduced a program called "Master Your Future," which deals with financial responsibility for high school students. Our teens got excited about this program and its potential for use throughout the state. MasterCard developed this program to help educators address financial responsibility in the classroom. To date, it has won eight major awards for excellence. The program consists of a 15-minute video and a 12-page teachers' guide, and covers budgeting, check and savings, credit and credit history.

MasterCard International was contacted and donated one complimentary copy, along with 30 student supplements, for each county. This is a great educational world of work program for teen councils and teen audiences in each county. Agents in all eight Extension districts have been trained in the Master Your Future program. To date, more than 600 4-H'ers have participated in this program.

Currently there are 7,485 youth enrolled in Utah 4-H work force preparation programs.

Source of funds: State, Smith-Lever

Scope of Impacts: Utah

Key Theme - Developing Youth Through 4-H Horse Programs

Brief Description: The challenge of the 4-H Youth Development Program is to prepare young people for adult responsibilities. 4-H horse projects are a natural for developing responsibility in youth.

Impacts: 44% of the 41 Extension agents indicate that their work in the 4-H Horse Program shows it to be one of the most highly involved and popular 4-H programs in the state. The 1999 ES-237 statistical report indicated that over 2,837 youth participated in horse projects. Each participant owns or has access to a horse, and develops skills in proper care, feeding, grooming, riding and showing, as well as participating in other horse related activities. 4-H youth participating in the four State Horse Shows and numerous county and regional competitions gain valuable learning experiences, increase knowledge and showmanship skills, exhibit and practice the horsemanship skills they have learned, and develop behavior skills through winning and losing gracefully. Youth also learn the reasons for, and the value of following rules, the value of health and safety and decision making skills. 4-H horse projects have the potential to teach responsibility through the care and keeping of their project animal and equipment, concern for others, record keeping, the value and importance of good ethics and hard work, and they help build self confidence and the ability to express one's self. All of these are quality life skills.

Source of Funds: State, Smith-Lever

Scope of Impacts: Utah

Key Theme - Developing 4-H Youth Through Junior Livestock, Dairy and Goat Programs

Brief Description: State 4-H and FFA Junior Livestock Shows were available to exhibitors from throughout the state, in addition to the many County Junior Livestock and Dairy Shows and the Utah State Fair. Each show has their own rules and guidelines, but they must also follow the state rules. These shows provide opportunities for youth to greatly expand the scale of their livestock and dairy project. 4-H youth participating in Junior Livestock and Dairy Shows increase their knowledge and showmanship skills, exhibit and practice the showmanship skills that they learn, and develop behavior skills through winning and losing gracefully. They learn the value of following rules and why those rules are made, record keeping skills, the value and importance of good ethics, hard work and decision-making skills. 4-H Junior Livestock and Dairy projects have the potential to teach responsibility through the care and keeping of their project animals and equipment, build self confidence and self esteem, develop concern for others and the ability to express one's self. All of these are essential life skills.

Impacts: According to the ES-237 statistical report, over 3,615 youth participated in beef, sheep, dairy, goat and swine 4-H projects. An additional 10,180 youth participated in the Ag in the Classroom program through embryology and agricultural farm field days school enrichment projects, which allow both urban and rural youth to be informed about agricultural science. One county indicated that they had 3,543 participants from 140 classrooms in 34 schools in the spring, and 898 more students from 35 classrooms in 9 schools in the fall. Student test scores on an agriculture literacy test prior to their visit averaged 66.4%. Following their day at the farm their test scores averaged 87.5%. Teachers rated the activity (on a scale of 1 to 10) 9.6 for meeting the goal of increasing awareness of the importance of agriculture. The overall rating for the activity, when compared to other away from school outings, was 9.7.

Source of Funds: State, Smith-Lever

Scope of Impact: Utah

" \l 3**Utah Agricultural Experiment Station**

Key Theme: Other - Health

Family Training, Development, Assistance, and Sociology

Brief Description: A study is underway to identify the various factors influencing susceptibility to hip fractures and fracture healing. In addition, researchers are attempting to determine whether (1) mutations and/or polymorphisms in the androgen receptor gene are associated with anthropometric variables; (2) mutations and/or polymorphisms in the androgen receptor gene are associated with altered blood androgen-to-estrogen ratios; and (3) habitually high intakes of fruits and vegetables are associated with higher blood androgen-to-estrogen sex hormone ratios and more densely methylated androgen receptor DNA. More work is being done in the area of investigating the associations among androgen receptor genotype, anthropometric variables, blood sex hormone levels, and dietary intake in healthy older human adults.

Impacts: No impacts are available at the present time from this work.

Source of Funds: Hatch Act

Utah (UTA) CRIS Project Numbers:

214 221 225

Funding Level: $892,094 **FTE:** 1.5

Scope of Impact: National and International

Key Theme: Other - Family-Community Relationships

Brief Description: Work is underway to assess the overall patterns of rural sustenance organization and population characteristics of nonmetropolitan places in Utah and adjacent counties of surrounding states, then to classify those places into discrete typological groupings based on economic structures and demographic make-up. Researchers are attempting to articulate the macro- and micro-level interconnections between population and socioeconomic dynamics and outcomes, specifically with regard to labor force underutilization, poverty, health adversity across geographical and temporal space, as well as the life course. A study has been undertaken to identify areas of northern Utah that are experiencing high levels of urban encroachment into agricultural areas, and to determine the extent to which those areas have exhibited accelerated conversion of farm lands to other lands. Scientists are attempting to determine how family factors (e.g., time, support control) enhance or impede work performance and well-being. The effects of group meetings and provider-trainer home visits are being evaluated with respect to child care. The divergence and complementarity of family and business management behavior in families who own and manage businesses is being examined. Rigorous scientific evidence regarding the effects of adoption as related to psychological and behavior problems of children and adolescents in the United States is being collected. Finally, work is underway with the intent of determining if rural residents who derive a majority of their income from farming and who have an interest in retiring are regularly investing for retirement and when and where they plan to retire.

Impacts: Much of the work is in progress and results are not yet available. However, results from one study suggest that rural farming residents generally do not invest in off-farm opportunities and their retirement is based primarily on the value of farm at the time retirement occurs, suggesting that the maintenance of rural land value is critical to such populations.

Source of Federal Funds: Hatch Act

Utah (UTA) CRIS Project Numbers:

839	869	971
843	885	972
844	985	988

Funding Level: $809,242 **FTE:** 2.2

Scope of Impact: Intermountain West, National

Cross-Cutting Management Initiative or Goal:

Agricultural Communications

Work continues by the Utah Extension Service to expand satellite access and offerings, including numerous programs directed at agricultural producers. The Utah Agricultural Experiment Station is involved in a quarterly publication of the *Utah Science*, a magazine describing recent advancements in research at Utah State University. In addition, both the Utah Extension Service and Agricultural Experiment Station are expanding the use of WEB pages with links to important research and Extension publications.

Enhancing Customer Service/Satisfaction

The Utah Extension Service and Utah Agricultural Experiment Station have worked extensively at enhancing customer service/satisfaction by arranging to meet with approximately 1/3 of counties in Utah each year in stakeholder listening session. This process was planned in 2000 and has been initiated in 2001.

Information Technologies

See comments for the two categories above. Information technologies are being relied on in ever increasing levels to reach all potential clientele for both research and outreach efforts.

Institutional Engagement

The process referenced above under *Enhancing Customer Service/Satisfaction* is the beginning of a significant *Institutional Engagement* program at Utah State University. In January of 2001, Dr. Kermit Hall became President of Utah State University and he has indicated that a major *Institutional Engagement* effort will be undertaken during 2001.

Multicultural and Diversity Issues

Work continues by both Utah State Extension and the Utah Agricultural Experiment Station to enhance multi cultural and diversity opportunities at Utah State University. This applies not only to the hiring process, where special encouragement is given to minority applicants, but also in the development and delivery of information.

Focus Areas Identified in FY 2001 CSREES Budget:

It is difficult to separate out the separate actions taken by the Utah Extension Service and the Utah Agricultural Experiment Station with respect to areas identified in the FY 2001 CSREES budget simply because the development of a knowledge base by the Agricultural Experiment Station naturally leads to the dissemination of such information by the Utah Extension Service. In the data provided below, specific Agricultural Experiment Station projects are referenced. Where a particularly noteworthy Extension components also exists, it is mentioned. However, even when not specifically noted, Extension activities almost always correspond to the general subject matter area listed.

Biobased Products:

No projects, accomplishments or results

Advances in Biotechnology to Develop New Agricultural Products:

UTA 099: Many researchers are establishing projects to identify economic trait loci (ETL) in livestock. The development of a genome map for sheep will greatly enhance the identification of genetic regions influencing economically important traits in sheep. The role of NAGRP and the U.S. Sheep Genome Coordinator is to facilitate the development of the ovine genome map, leading to the identification of ETL in sheep.

UTA 164: The isolation and characterization of the callipyge gene will lead to many exciting areas of study. Elucidation of the gene may allow better understanding of the relationship between muscle development, fat accumulation and tenderness. Possible manipulations of the gene may lead to improvement of carcass composition in other livestock species.

UTA 166: The ability to understand the mechanism associated with bovine oocyte activation could be applied to the nuclear transfer technology to increase the efficiency of embryo production. In addition, results of transgenic milk production experiments provide the feasibility of producing potentially harmful proteins at commercial levels in the milk of transgenic animals.

UTA 460: Callipyge is a major gene responsible for a pronounced muscle hypertrophy in sheep. We have initiated a multi-faceted approach for the identification of the causative gene in callipyge.

UTA 223: Fat removal has an adverse effect on cheese flavor and texture properties. The identification and characterization of microbial enzymes that are chiefly responsible for the production of cheese flavor defects will allow industry to develop starter systems that improve lower-fat cheese quality. This will increase consumer confidence in lower fat cheeses and expand the demand for these goods to individuals that avoid cheese because of diet and the absence of high quality low fat alternatives.

UTA 390: This research should result in a very economical hazardous waste or environmental cleanup technology. This can result in far less risk to environmental pollutants. Therefore, the economic, environmental and social impacts could be very significant.

Extension efforts primarily involve the transfer of these technologies to society at large. In some cases, the processes are patented or potentially so. Even in these instances, the technology is dispersed to the public, albeit often through a commercial entity with the assistance of Extension.

Improved Pest Control and Food Quality and Protection Act Implementation

UTA 524: The research seeks to determine and enhance the impact of biological control insects (predators and parasitoids of insect pests, and weed-feeding insects) on target pests in Utah alfalfa and rangelands. More effective biological control of pest insects and weeds can enhance agricultural productivity while reducing the need (and associated economic and environmental costs) of pesticide application.

UTA 527: Methods for control of plant disease that are compatible with the environment are desired and biological control of pests is one strategy. We have identified several genes in a beneficial bacterium that are essential for survival on root surfaces under competitive conditions in the soil. Exploiting these traits may enable more effective use of the beneficial strains under field conditions.

UTA 551: The project will give Utah and other growers ways to test for resistance problems before they spray.

UTA 618: Testing and demonstration of new, lower toxicity chemicals for control of disease and arthropod pests of tree fruits is important to the viability of the state's fruit industry. EPA is eliminating many traditional, broad-spectrum pesticides, and research and extension efforts are needed to assist growers with implementing new, more selective controls. The determination of alternative bactericides for fire blight control is critical now because streptomycin resistance was detected in Utah strains of the pathogen, Erwinia amylovora. Our studies on the role of injury and leaf age in fire blight infections will be used to develop methods to aid fruit growers to use the correct strategy to control fire blight following a rain or hailstorm. Evaluation of lethal and sublethal effects of fungicides allows our recommendations for control of powdery mildew and other fungal diseases to include information on possible effects to phytophagous and predaceous mites.

UTA 626: The plum curculio (PC), Conotrachelus nenuphar, is a quarantine insect in the western U.S., and negatively impacts the export of fruit to outside markets. Delimitation of the insect's distribution to one county in Utah and identification of the primary habitat and hosts will assist Utah's agricultural regulatory agency in

suppressing and eliminating this pest in northern Utah. This information will also assist commercial fruit growers in other counties of Utah in keeping their export markets open.

Invasive Species Program

UTA 743: Weed management strategies developed by this project are in extreme demand by producers and land managers faced with the nearly impossible task of controlling these troublesome plants. Some represent first ever control options.

Dr. Steve Dewey, an Extension specialist, is a world renowned expert in the area of invasive species. Dr. Dewey's work with Dr. John Evans (an Experiment Station scientist) has helped identify existing and potentially significant invasive species, as well as develope alternative means of attempting to control such species.

Modifying Food Intake Behavior

UTA 209: It is well known that age-diminished intestinal calcium transport can contribute to poor bone health. The molecular/cellular basis for decreased vitamin D-stimulated transport appears to be through the membrane-initiated, rather than the nuclear-initiated pathway. This may suggest new approaches for treatment of the elderly.

UTA 214: Our results to date provide support for a protective effect of dietary protein intake against the risk of osteoporotic hip fracture in women 50-72 years of age. Dietary vitamin K intake also appears to be associated with a reduced risk of hip fracture in both men and women. These findings, if confirmed by randomized trials, may provide new methods for the nutritional prevention of osteoporotic hip fracture.

UTA 220: Intake of calcium is declining among youth in the U.S. Adequate calcium intake is essential for protection against osteoporosis, and perhaps colon cancer and hypertension. To reduce disease risk, rigorous research needs to be accomplished on the types and quantities of calcium-rich foods that youth are consuming, as well as motivators and barriers to intake. This knowledge will aid in the design of intervention strategies to reduce disease risk later in life.

UTA 227: This research further supports the concept that 24,25(OH)2D3 is a 'new' hormone with inhibitory effects. Calcium and phosphate balance might be improved in some disease states by finding ways to reduce the levels of the 'new' hormone. Conversely, 24,25(OH)2D3 might be used to protect against hypercalcemia.

Nutrition and Food Science Extension specialists, in addition to others housed in the College of Family Life, have worked to enhance the food intake practices of many of the poorer households in Utah through the nationally recognized EFNEP program. There is substantial evidence that intervention through the EFNEP program provides a long-term change in the dietary patterns of households who have participated in the training.

Organic Agriculture Production and Processing Methods

UTA 861: Compost application for use in onion production will be evaluated. The project is designed and the plots will be planted in the spring of 2001. The study will consist of five treatments: a control, two compost treatments, a commercial fertilizer treatment and a compost and fertilizer blend. This research should provide data for Utah onion producers who are considering organic production. The project will examine the value and safety of using compost as a soil amendment for specific vegetable crops and condition in Northern Utah.

UTA 863: Northern Utah supports a thriving dairy industry, 47% of Utah's 90,000 milk cows, with more than half of the farms milking fewer than 200 cows. Composting may provide the greatest benefit per cost to the producer; and represent only moderate impacts to the environment. This project developed methods of bovine mortality composting that would perform effectively within Northern Utah's arid climate and be acceptable to local dairy operators from an economic and labor perspective. We established ten mortality compost trial replicates, five using wheat straw and five using coarse sized soft-wood sawdust. Adult Holstein mortalities

were placed on 30.5 - 45.75 cm (12-18 in) of dry co-composting material, covered with an additional 45.75 - 61.0 cm (1.5 to 2 ft) of material, and watered to a moisture content of 60% by weight. Temperature and pile decomposition characteristics were recorded daily along with ambient conditions. After 15 and 23 weeks, each replicate was opened, photographed, characterized as to carcass decomposition, aerated and re-covered. Within two weeks of cow placement, interior temperatures of sawdust piles reached their operating peak near 60 C (140 F). Straw piles reached 48.8 C (120 F) within the same time span. Both groups maintained maximum temperatures for four weeks. Temperatures declined steadily after four weeks until pile opening and re-aeration at 15 weeks. After opening, temperatures of straw piles continued to decline to near 18.3 C (65 F), while sawdust piles experienced a second temperature spike and subsequent slower decline. Piles maintained temperatures equal to or above ambient conditions through December. Liquids leached from all piles. Sawdust piles leached more than straw piles when adjusted to similar moisture content. In spring the next year, after 10 months duration in compost piles, the end product was analyzed for macro and micronutrient content and applied to agronomic land. Most of the bones were brittle and broke into small pieces from the action of mechanical spreading. The end product was below EPA biosolid limits for all heavy metals. C:N ration for straw piles was 34; sawdust was 46. We found composting of animal mortalities to be an economical disposal option that is relatively environmentally benign. Compost media should be selected based on management criteria; sawdust piles did not heat as high as sawdust, generated more odors, but had faster decomposition. Incidental mortality of calves and adult cows occur on farms. Composting represents a viable method of disposal of animal mortalities, potentially providing economic and environmental benefits over other disposal methods.

This information is being disseminated through Extension specialists working in the Agriculture Systems Technology and Education (ASTE) department at Utah State University.

Scientific Basis for Optimal Health

UTA 214 : Our results to date provide support for a protective effect of dietary protein intake against the risk of osteoporotic hip fracture in women 50-72 years of age. Dietary vitamin K intake also appears to be associated with a reduced risk of hip fracture in both men and women. These findings, if confirmed by randomized trials, may provide new methods for the nutritional prevention of osteoporotic hip fracture.

Much work is also being done by nutrition Extension faculty who are involved with numerous applied studies with the State's Native American Population as referenced elsewhere in this report.

Small Farms and Their Contributions to Local Economies

UTA 012: This research has significant implications for Utah farmers and nonagricultural enterprises. The measurement of profit and the organizational structure of the business can be significantly impacted by both state and federal income taxes. Careful tax planning and identification of the appropriate corporate structure can result in significant tax saving and enhanced valuation of Utah farms and nonfarm property.

UTA 074: The rural health care study suggests several concrete steps which local communities can take in order to further improve health care. Local subsidies and restrictive legislative policies have resulted in high costs and inefficient health care providers. The banking study should suggest whether or not concentration in banking (that is, the proportion of local deposits held by large banks) impacts rural economic development and the availability of credit. The snowmobiling study will provide information to decision-makers on the potential impacts of altering policy with respect to access to recreation areas.

Much work by the economics Extension specialists, as well as those from departments in the College of Family Life, are working with small farms to assess and enhance their contributions to local economies.

Sustainability of Agriculture and Forestry

UTA 701: These findings will help foresters recognize two important agents which stress forest vegetation and increase its susceptibility to bark beetles and diseases.

UTA 703: Findings from this research emphasize the critical relationship between dynamics and below ground nutrient cycling processes. Outcome of this research is relevant to the productive capacity of soils (nutrient availability and release); the sustainability of certain landuse practices; the ability of wildland ecosystems to retain exogenous elements (e.g., atmospheric N pollutants); and the functioning of wildland soils under changing global climate (e.g., rate change of processes).

UTA 704: Ecosystem management research has been and is being done to reconstruct the conditions of past ecosystems in the American West, for periods within the 150-year period examined. But no research has been done to gauge what people as naturalists of the times thought was proper and improper management of their ecosystems. From this, judgment can be made as to how these people of the past would, if brought back to life, react to the state of present ecosystems and the current visions of managing these ecosystems. Second, judgment can be made as to how much of an ecosystem management perspective these people had.

UTA 705: Extension forestry education programs will reach more landowners. Urban forestry professionals will better-understand the professions demographics and the experiences of women and minorities in the profession. The urban forest resource at Camp Williams National Guard facility will be safer, more abundant, healthier, and more valuable.

UTA 709: The regional growth projections allow stakeholders in the Mojave Desert to predict the likely "footprint" of future development under a wide range of assumptions (e.g., low density development, high density development, trend population growth, etc.). These forecasts are of great interest to the Department of Defense, which is seeing its military installations encroached upon by residential development. Land management agencies like the National Park Service and BLM are also interested in assessing how future development will affect the habitat of species of key concern like the desert tortoise.

UTA 713: Results from this project are contributing to the way that Intermountain subalpine forests are managed for variety of objectives. In addition the development of appropriate silvicultural systems, experimental units contribute to demonstration objectives. The recent lynx listing, the snowshoe hare/stand density work has taken on even greater importance.

UTA 726: These studies all present social science data collected at the regional level, rather than for one site or administrative unit. This increases the value of the results for: 1) setting management objectives, 2) providing a spectrum of recreation opportunities, and 3) meeting both ecosystem management and social equity goals in natural resource resource planning. The results also indicate that there are problems with certain standard recreation management practices, policies, and planning approaches used by federal and state agencies, such as the standard application of recreation carrying capacity (RCC). RCC often results in visitor use limitations in heavily used areas, and this approach may actually exacerbate rather than reduce both ecological and social impacts of recreation use on public lands.

UTA 737: This project has had several positive impacts for various natural resource users in Utah. Understanding consumption patterns of people dependent upon water from the Wasatch-Cache National Forest has identified water conservation approaches that could potentially serve more users with existing supplies, lowered the costs of expanding water delivery systems, and reduced environmental impacts on streams. Finding ways to administer fish health programs in Utah so as to reduce the risks of spreading pathogens and of introducing exotic species has economically and environmentally benefitted a range of stakeholders, particularly private aquaculturalists, sport fishermen, and resource managers working for federal, state, and local governmental entities.

Much of the work of the Extension specialists associated with the College of Agriculture at Utah State University is directed toward the sustainability of agriculture in the State of Utah. In addition, numerous Extension specialists from the College of Natural Resources are engaged in maintaining a sustainable forest ecosystem in Utah and Intermountain West.

Water Quality

UTA 324: The Impact of this year's results should improve aspects of field soil structure management for better hydraulic and structural properties towards reducing impact of compaction and costs of tillage, enhancing crop yields due to improved soil tilth management, and improving conditions for compliance with EPA regulations for agrochemicals transport.

UTA 338: This research and the educational materials resulting from the project have facilitated land application of biosolids as an option to landfill disposal in Utah. Currently, approximately 50% of the municipal biosolids produced in Utah are recycled through land application, thereby reducing the need for and cost of landfill disposal.

UTA 446: The benefits of this project are information on the amount of potentially conservable water in both agriculture and landscapes, and a means for estimating landscaped area such that the amount of water actually used in landscapes can be calculated. This project has a potentially large impact on urban water use in the West. The approach to water conservation developed from this project will serve as a model for other urbanizing areas in the arid West. Water purveyors in the West, and the rest of the country, can use methodology developed from this project to analyze landscape water demand and determine the amount of landscape water that could actually be saved if the need should arise. The outcome of this project will increase their awareness and provide tools to fine-tune water demand.

UTA 332: This is a cooperative study that will examine the fate of nutrients in a grass-legume grazing system. In areas with high ground water tables, leachable nutrients are of great concern.

UTA 942: Information developing from this project continues to assist owner/operator, private consultants and agency personnel in making informed decisions regarding integrated solutions to the manure treatment and management problems associated with Animal Feeding Operations.

Work by the Extension specilaist, Dr. John Harrison from the ASTE Department, is directed toward the issue of water quality.

Science and Impact Writing Process Results

The following are only examples from the 2000 S&E Impact Report Update which can be accessed at the following WEB site: http://impact.reeusda.gov/impact/2000/public.cgi

Utah Competitive Agricultural Systems in a Global Economy

Issue: The price per hundredweight for milk in January 2000 was about $8.00 less than 1998 so it is important to for dairymen to cut input cost wherever possible.

What has been done: USU Extension Agent Mark Nelson balanced 12 feed rations for four dairymen. In one case he was able to help one dairyman increase production from 40 pounds of milk per cow to 65 pounds.

Impacts: Even subtracting for the extra cost of feed this will help this dairyman produce an extra $108,624 worth of milk annually.

Source of Funds: Smith-Lever 3(d) (e.g., EFNEP, CYFAR)

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Healthy, Well Nourished Population

Issue: Food safety will continue to be an issue at home as well as in public. If 1/3 of the food dollar is being spent on food away from home, that means 2/3 is still coming home to be consumed. While the restaurant has the potential of affecting more people with food borne illness, the home is still the front line in the battle against outbreaks. Additionally, the office handled more than 1,700 calls on food storage issues this year. Extension also remained the county's major source of canning information and acted as a test center for pressure canner safety. More than 200 pressure canners were tested in 1999.

What has been done: USU Extension educators taught nine classes in food safety reaching 244 homes. It also trained 18 Family and Consumer Science High School teachers in food safety at the annual Utah Association of Family and Consumer Sciences conference in May. Estimating two classes per teacher with 30 students per class would total to over 1,000 students who would or will receive training in food safety.

Impacts: Salt Lake County Extension can take some of the credit: During March 1998 the county epidemiology reports were released. "Hepatitis A" dropped from 677 reported cases in Salt Lake County in 1996 to 226 cases in 1997. Salmonella cases dropped from 169 in 1996 to 101 in 1997. Shigella cases dropped from 134 in 1996 to 26 cases in 1997. Not only have the total number of cases dropped but the number of cases per 100,000 citizens also dropped significantly. Hepatitis A dropped from 81.2 in 1996 to 27.1 in 1997. Salmonella dropped from 21.0 in 1996 to 12.1 in 1997. Shigella dropped from 15.1 in 1996 to 3.1 in 1997.

Source of Funds: Smith-Lever 3(b) & (c)

Contacts:

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Issue: Families living on fixed incomes and/or trying to get off public assistance often need help with menu planning and food buying.

What has been done: USU Extension agent Faye Boyer's Family Nutrition Program assisted many low-income families in the south end of the county. Menu planning was greatly increased and homes started having enough food to reach from pay check to pay check.

Impacts: The average monthly grocery bill dropped from $261.22 per month to $230 per month with the average income remaining at $920.44.

Source of Funds: Smith-Lever 3(b) & (c)

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Greater Harmony Between Agriculture and the Environment

Issue: Utah's future depends on water. It is one of the driest states in the U.S. while at the same time being one of the fastest growing. Utah's residents also have the second highest per capita water consumption in the U.S.

What has been done: A USU Extension agent along with USU irrigation specialist Bob Hill met with two irrigation companies concerned about water measurement. The Lakeshore Irrigation Company wanted to establish baseline data for its water delivery system in order to insure maintenance of those levels in future years. The American Fork Irrigation Company was concerned about measuring the amount of water being diverted to other customers.

Impacts: Assuming a value of $15 per acre foot these two companies are now better able to manage $495,000 worth of water each year. In the case of the American Fork company, they may actually save $54,000 worth of water that might have otherwise gone incorrectly to other users.

Source of Funds: Smith-Lever 3(b) & (c)

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Issue: Salts from agriculture has been an ongoing problem for more than 20 years. The excess salt kill fish and contaminate irrigation water downstream. Converting from furrow (ditch) irrigation to sprinkler systems can greatly reduce the problem.

What has been done: In 1999 USU Extension and the Ferron Watershed Planning Committee completed a three-year project to convert 1,600 acres of farmland from furrow to sprinkler irrigation.

Impacts: The project will save water, increase crop yields and reduce the salt loading from the Colorado River by 47,000 tons annually.

Source of Funds: Smith-Lever 3(b) & (c)

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Economic Development and Quality of Life for People and Communities

Issue: As the median price of homes has doubled in Utah in the ‘90s.

What has been done: Leona Hawks' Home Ownership workshops have helped nearly 1,000 individuals and families in Cache, Rich and Box Elder counties.

Impacts: Participants saved an average of $500 to $5,000 on the purchase price of their homes. Nearly 100 participants were able to take advantage of special grants up to $2,000 to help them purchase a home.

Source of Funds: State, Mineral Lease Funds

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Society-Ready Graduates

Issue: Mentoring is a proven technique in reaching at-risk youth, but communities need guidance in setting up these programs.

What has been done: Utah State University Extension's Youth and Families with Promise Program is designed to address youth problems through early intervention with at-risk youth and their families. This program is located in eight of Utah's 29 counties and is based on a two-level mentoring approach utilizing college age mentors who work directly with the identified youth and retirement age mentor couples who work with the parents and other siblings. The college-age mentors focus on motivation and tutoring relating to reading and academic skills; wholesome, structured community recreation, community service, involvement in 4-H and other community youth groups; and fostering the development of social and emotional developmental assets.

Impacts: Large percentages of the at -risk youth in the programs reported decreases in risk behaviors as a result of being in the program. For instance: 95% of the youth skipped school less; 94% had reduced incidence of parents being called to school for a conference; 93% had less trouble with police; 90% showed reduced incidence of cheating at school; 90% had less stealing infractions; 83% had fewer infractions for destroying property; 80% were less likely to smoke marijuana; 79% were less likely to get in a fight; and 73% were less likely to smoke cigarettes.

Source of Funds: Smith-Lever 3(b) & (c), State, Mineral Lease

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B. STAKEHOLDER INPUT PROCESS

Actions Taken to Encourage Stakeholder Participation

Utah State University Extension and Agricultural Experiment Station developed a collaborative Cooperative State Research Education and Extension Service (CSREES) four-part stakeholder input plan which is open, fair and conducted with respect and dignity.

Part one of the plan began in early December 1998 the Utah Cooperative Extension (CES) and the Utah Agricultural Experiment Station (UAES) stakeholder development team devised a plan, which would insure stakeholder input at the county, regional, and state level for the initial five year plan of work. Stakeholders at each of these levels, including specialty commodity groups, community and regional leaders, Extension advisory committees, and lay citizens and under-served minorities, were identified and then invited to participate in stakeholder meetings held in 28 Utah counties. Public announcements extended the invitation to all interested parties in the county and regions of the state.

Extension advisory councils convened these open meetings held between January - March 1999, seeking input on programs and research that potentially could be developed and conducted in respective counties. More than 500 persons statewide participated in these open to the public meetings. Additionally, advisory councils solicited input from under-represented minorities, commodity group representatives and community leaders. County Extension staff refined and developed program action plans following these stakeholder input meetings. Careful consideration was given to stakeholder needs as these program action plans were developed.

The second part of the stakeholder input plan included meetings in nine regional CES and UAES areas of the state. Stakeholder listening sessions were held March - April 1999. These sessions involved over 350 individuals who came to participate in a futuring session on how they perceived the next five years would change their communities and to establish targeted program and research priorities based on those perceived changes.

The third part of the plan conducted in 1999-2000 included not only review of the county POW but also continued county reviews of the full targeted state plan of work by local advisory councils. This action ensured understanding for the full state plan and developmental action plans for POW implementation within local communities. Since advisory council meetings are open to the public this facilitated fair idea exchange between council members and other stakeholders. Council members and others suggested local modifications to the full state plan and suggested means for enhancing plan outcomes.

Part four of the plan was developed in late summer 2000 for implementation in early 2001. The plan includes a random selection of ten urban, semi-urban, transitional and rural Utah counties that as a group are representative of state population demographics. These counties are involved in a customer satisfaction and future needs survey as one way of receiving stakeholder input and feedback on program delivery. Additionally, stakeholders will be invited to participate in an open public reporting session where county Extension leaders will share the 1999-2000 outcomes and impacts of programs.

A component part of these reporting meetings is a stakeholder listening session. In this stakeholder listening session participants will review the county five-year plan and suggest modifications, additions and deletion to the plan. On-going discussions will ensue with the county Extension staff to determine what POW actions should be undertaken as a result of stakeholder survey results and county listening sessions. Input from county Extension staff and county stakeholders will be considered and revisions of the USU CES full state plan of work will be forthcoming in late summer 2001.

" \l 3**Statement of Process used by Utah State University to identify individuals or groups as stakeholders and to collect input from them.**

County Extension staff and advisory councils undertook the identification of individuals and commodity stakeholder groups. Volunteer leaders serving on Utah Extension advisory councils have been selected to represent ethnic minorities, business, industry, education and civic leaders in the community. These councils along with Extension staff have rapport and an understanding of the population demographics within their community. Special targeted invitations to participate in stakeholder listening sessions was extended by the Extension staff and councils with special efforts

being extended to underserved minority groups within the county and region. Typically in Utah these underserved minority groups include Latino, Southeast Asian immigrants and indigenous Native American populations.

Statement of how collected input was considered.

Following Extension statewide and county listening sessions a compiled list of stakeholder concerns issues and needs was developed. A compilation of items determined to be the most important from stakeholder input meetings (not ranked in order of importance) are provided herein under the Agricultural Experiment Station and Extension subheadings.

Agricultural Experiment Station

Preserve farmland and open spaces
Improve production efficiency
Determine ways of enhancing quality of life and improving family life
Identify the important relationships between work and family
Develop socially acceptable methods of water conservation, recycling, and use
Develop alternative crops and enhance existing crops
Expand study of intensively managed pastures
Investigate best methods of waste control and disposal
Expand marketing options for farmers
Develop better methods of weed control/management
Develop methods of identification and control of animal and plant diseases

Utah Cooperative Extension Service

Continue and expand technical to production agriculture, homeowners, and gardeners, etc.
Expand master gardener program
Encourage increased participation by volunteers
Develop more technically related short courses (pesticide applications, etc.)
Provide information to public on food safety
Explore various livestock and crop marketing options
Develop more community-based leadership programs for youth
Continue with the satellite educational programs
Provide information related to water use, conservation, and re-use
Assist in development of community networks
Expand use of partnerships to accomplish mutual purposes
Educate the population as to what agriculture is and does
Provide flexible program in money and financial management
Educate local officials and populations regarding growth issues.

The development of work action plans by Extension program leaders reflects the issues, concerns, and needs of stakeholders who have shared and will share in the future their perceptions for Extension programs. The on-going process of stakeholder input ensures the plan vitality now and in the future.

C. PROGRAM REVIEW PROCESS

Merit Review Process - Extension Plan

The Cooperative Extension Service merit review process will involve a review by the University of Wyoming, University of Arizona, and the University of New Mexico Extension Services. These institutions will review the program components suggested in each program area utilizing Extension faculty qualified as specialists with significant program experience in the area being reviewed. In turn, Utah State University Cooperative Extension Service will review the program plan of work from these three institutions.

Scientific Peer Review Process - Agricultural Experiment Station

The scientific peer-review process within the Agricultural Experiment Station involves two steps. The first step includes a review by two scientists requested by the principal investigator (PI). These two scientists provide written comments regarding the proposal and return them to the PI for evaluation and use as appropriate. Prior to submission, the PI's Department Head also reviews the proposal. Once the proposal reaches the station, two additional scientific peer reviews are obtained, either from other on-campus faculty (if the expertise exists) or off-campus faculty (if on-campus expertise does not exist). The review returned to the Experiment Station is forwarded to the PI with comments from the associate director as to any recommended changes that need to be made.

There have been no significant changes since the submission in the last 5-year Plan of Work.

D. EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES

1) Did the Planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

The planned program areas for the Utah Agricultural Experiment Station are: *(1) Plant and Animal Health and Safety, (2) Agricultural Product Enhancement, (3) Pasture Reclamation, Development, and Quality, (4) Human, Wildlife, and Domestic Livestock Interactions and Compatibility, and (5) Family Training, Development, Assistance, and Sociology.*

The planned program areas for the Utah State University Extension Service were *(6) Agronomy/Crop Production, (7) Horticulture, (8) Livestock, (9) Safe and Secure Food and Fiber System, (10) Nutrition and Health, (11) Rural and Community Forest Extension, (12) Sustainable Livestock Production, (13) Rangeland Resources Extension, (14) Noxious Weed Control, (15) Families and Youth at Risk, (16) Business Retention and Expansion, (17) Economic Development Planning, and (18) Youth and 4-H, (19) Sustainable Agriculture, (20) Integrated Pest Management, (21) Utah Pesticide Impact Assessment Program., (22) Expanded Food and Nutrition Education Program, (23) Statewide Water Quality Education and Technical Support, (24) Non-point Source Pollution, (25) Renewable Resources Extension Act, (26) Native American Programs.*

The relationship between the program areas identified above and the stakeholder issues identified below are indicated by various superscripts, where the superscript value corresponds to the number associated with the planned program area. These stakeholder issues were identified in the process described in this document, as well as the initial Plan of Work for Utah State University's Extension Service and Agricultural Experiment Station.

Improving production efficiency [1, 2, 6, 7, 8, 12, 13, 20]
Preserving farmland and open spaces [4]
Determining ways of enhancing quality of life and improving family life [5, 15, 16, 17, 18, 22, 26]
Identifying the important relationships between work and family [5, 15, 16, 17, 22, 26]
Developing socially acceptable methods of water conservation, recycling, and use [4, 23, 24, 25]
Developing alternative crops and enhance existing crops [1, 2, 6, 7, 19, 20]
Expanding study of intensively managed pastures [3, 6, 8, 12, 20, 23, 24]
Investigating best methods of waste control and disposal [4, 9, 12, 21, 22, 24, 25]
Expanding marketing options for farmers [2, 6, 7, 8, 9, 11, 12, 16, 17]
Developing better methods of weed control/management [1, 2, 3, 14]
Developing methods of identifying and controlling animal and plant diseases [1, 2, 6, 7, 8, 9, 12]

(2) Did the planned programs address the needs of under-served and under-represented populations of the state(s)?

From the Plan of Work submitted in 1999, the following traditional groups were identified as under-served and under-represented, though there are a potentially large number of other under-served and under-represented such as small specialized vegetable growers, specialty livestock producers, etc.,

Hispanics
Blacks
Asians
Elderly
American Indian
Women
Home Gardeners
Urban Residents

Research activity as conducted by Utah State University is neutral in terms of addressing the needs of under-served and under-represented. For example, research into proper water management in an urban environment applies to all urban residents, regardless of ethnicity, age, etc. The same would hold true for research related to beef cattle or dairy.

Information provided through Extension is also neutral to the audience it addresses. However, specific Extension or outreach activities may not be specifically targeted to under-served or under-represented groups. However, through their *Civil Rights Plan of Work* Extension has moved toward collaboration with other USDA agencies, community organizations, minority serving agencies, and multi-county groups to develop new and innovative outreach programs. These include, but are not limited to, outreach nutrition programs, literacy, youth development, workforce preparedness, gleaning and harvesting projects, community gardening projects, financial management training, and the identification of affordable housing. In addition, farmers ranchers and employers have been surveyed to identify needs of minority workers. Programs have been taken to locations where minorities, the elderly and other groups frequent, rather than expecting them to come to us. This is particularly applicable to the Native American and Hispanic populations in Utah. Educational programs are provided in the Spanish language via translators, publications, fact sheets, etc., as budgets allow. Continued diversity training is being offered.

Special efforts were made to serve the under-served and distinctive Utah minority populations with CES and UAES programs and projects. Staff reported a 50% increase in contact with minority populations over the reporting period. More than 80% indicated that they had delivered more educational programs to under-served populations than in the previous year. Many of the staff participated in cultural awareness training to facilitate effective program design, development, and delivery. Key programs serving the under-served and minority populations in Utah included: The Western SARE program working with the Navajo Nation; 4-H workshops at county summer camps; family nutrition education programs; FNP pre and post dietary recalls with data analysis and feedback with the Navajo and Ute Nations; specialized computer literacy programs for Latino communities; and sharing of research findings with minority farm workers. Over 50% of staff had increased advertising for Extension programs beyond traditional mass-media methods including workplaces, gas stations, grocery stores, laundromats and churches to promote increased contact with under-served and minority populations.

Did the planned programs describe the expected outcomes and impacts?

The planned programs, as developed in the 1999 Plan of Work submission, with the Extension portion modified in 2000, does describe expected outcomes and impacts in sufficient detail to provide a means of evaluating their effectiveness. See original Plan of Work submitted by Utah, with the 2000 amendment provided by Utah State University Extension.

Did the planned programs result in improved effectiveness and/or efficiency?

This progress report comes early in the Plan of Work's time frame and it is difficult at this point to determine if the planned programs have resulted in improved effectiveness and/or efficiency. However, several factors can be identified which indicate that the planned program is moving in a positive direction. First, several of the outcomes have been achieved in the affirmative. Second, more attention is being given to the issue of "impacts" as opposed to "processes," though there is still a need for considerable improvement. Additional training is needed in the area of impact statements and will be undertaken. Third, there is a more direct connection between FTE actions and the desires of stakeholders as evidenced by the large number of stakeholder requests which are presently being addressed.

E. MULTISTATE EXTENSION ACTIVITIES

Multi-State Brief Summaries

Agronomy and Crops

Seventeen agriculture agents reported multi-state activity in 1999-2000. Multi-state activity with states with the largest number of activity interactions in descending order included: Wyoming, Montana, Idaho, Colorado, Nevada, New Mexico, Arizona, California, Oregon, and Hawaii. Ten Western regional projects were funded through Utah State University and Western SARE in 2000. The projects were funded in nine states and addressed six academic topics. Projects by discipline and state were: agronomy (Montana and Wyoming), soil science (Colorado, Utah, and California), ag marketing (Oregon), horticulture (Oregon and Washington), entomology (Arizona), and water quality (Idaho).

Novel Crop Rotation Blocks Nematode Damage in Sugar Beets -
Grazing lambs in nematode - controlling crops such as radish and mustard helps offset grower costs.

Goat Grazing System Creates New Profits -
A New Mexico rancher finds it easier to raise goats, steer, hogs and broilers on well-managed pasture than in confinement.

Cover the Soil, Reduce Disturbance and See Improvements Soon -
Oregon State University research assistants have monitored insects on a broccoli crop as part of their experiment examining the benefits of cover crops and other management strategies to improve soil.

Western states workshops and training programs were conducted on the cereal leaf beetle, improving alfalfa yields, techniques and varieties for improving small grain yields and pasture improvement projects.

Livestock

Twenty-four agriculture agents reported multi-state activity in 1999-2000. Multi-state activity with states with the largest number of activity interactions in descending order included: Arizona, Nevada, Wyoming, Colorado, Montana, Idaho, New Mexico, California, Oregon, and Washington.

Dairy Extension cooperative contract programs with Nevada, Wyoming, and Montana. Utah State University Dairy Extension specialists have traveled to the dairy production regions of Nevada, Wyoming, and Montana to meet dairy producers and Extension agents. Workshops have been conducted in all states. Dairy farmers receive the USU newsletter and have email and telephone access to diary science expertise from USU. Extension specialists have visited individual dairies in all collaborating states and have been able to conduct educational workshops for dairy farms and separate in-service workshops for county agents.

Through the Western SARE program nearly every western state has been involved in SARE livestock producer related workshops and training programs. Stellar programs were delivered on animal behavioral principles and livestock management. An on-going annual program with the Arizona strip livestock and range group involves USU personnel in the design, development and orchestration of training and conference activities. USU staff was involved in chairing the Western Beef Resources Committee - Genetics subcommittee- that published the Cow/Calf Management Guide.

Youth and 4-H

33% of 4-H agents reported multi-state activity in 1999-2000. Multi-state activity with states with the largest number of activity interactions in descending order included: Idaho, Colorado, Arizona, Nevada, New Mexico, Hawaii, Oregon, Wyoming, and Montana.

A sample of the type of multi-state activities Utah 4-H has engaged in with primarily other western states follows.
A highly successful Idaho interstate leadership training exchange is ongoing. This leadership exchange has fostered cross training of livestock and horse judges and evaluation strategies used in judging 4-H livestock and horse activities.

Utah and Colorado have collaborated on the Western Regional Teen Leadership Camps and the cooperative curriculum service (CCS) which has guided the curriculum for numerous 4-H projects. New Mexico, Colorado, Utah and Arizona have joined together to provide programs for Native American 4-H youth in both the development of projects and activities. Montana interaction has included the leadership training of 4-H Ambassadors. Arizona activities include youth development programs for the Arizona strip. Utah has participated with all western states in the development and evaluation of 4-H marketing leadership and volunteer recruitment brochures, posters, pins and videos. Projects with Wyoming have included fair judges training and county fair judging activities, livestock operations management training and youth livestock project training.

Economic Development and Planning

Work with economic development involved collaborative efforts with the following states: New Mexico, Nevada, Montana, Oklahoma, and other Countries: Hungary and Poland. Five specialists/agents were involved in these multi-state projects.

Utah collaborated with western states who are working with small cities and shared how survey and questionnaires could assist them in better understanding businesses needs. The utilization of the IMPLAN Input-Output model in projecting economic impacts of various business scenarios was explored with other western states. One specialist reported working with agencies in other states on target industry and business retention and expansion models and applications.

Business Retention and Expansion

Multi-state activity included interactions with Colorado, New Mexico, Arizona, Nevada, California, Washington, Idaho, Wyoming and Montana.

Utah Extension personnel were involved in the development and application of a retention and expansion model. This model was designed to help businesses adopt retention, expansion strategies and best practices. Other multi-state collaborative efforts included: checking food labeling compliance; survey information about stored grain pests and problems for new Malt-o-meal plant; the NASA geospatial program collaborates with concurrent programs in Arizona and Mississippi, workshops were attended by faculty from MT, CO, OR, CA, and WA; worked with Extension and state specialists in developing and applying retention and expansion model.

F. INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

Each of the following Utah (UTA) Agricultural Experiment Station Projects (arranged by CSREES Goal) includes an Extension Service component, even though not all are identified by Extension for expenditure percentage purposes.

Goal 1: An Agricultural Production System that is Higher Competitive in the Global Economy

190 - Increased Efficiency of Sheep Production
103 -A National Agricultural Program to Clear Pest Control Agents for Minor Uses
114 - Improving Turkey Production Through Management Nutrition and Environment
157 -Improving Ruminant Utilization of Low-Quality Forages via Genetic Animal Selection
179 - Grazing Livestock Nutrition and Management to Improve Production Efficiency
418 - Management of Intensive Grazing on Irrigated Pastures for Dairy Cattle
449 - Feeding Strategies to Optimize Dairy Cow Performance with Minimum Environmental Impact
461 - Improvement and Impact of Production and Management Practices in Utah Turkeys
478 - Variation in Body Condition Score of Beef Cows as an Effector of Low-Quality Forage Utilization
332 - Environment and Economic Impacts of Nutrient Management on Dairy Forage Systems
524 - Biological Control in Pest Management Systems of Plants
624 - Puccinia Thlaspeos as a Biocontrol Agent for Dyer's Woad
628 - Stomatal Responses to Humidity in Wheat
797 - Water Use, Growth, and Irrigation Management of Grass and Grass/Legume Pastures at High Elevations
249 - Crop Improvement Through Seed Certification
279 - Freeze Damage and Protection of Horticultural Species
292 - Rootstock and Interstem Effects on Pome and Stone Fruit Trees
328 - Improvement of Winter Wheat Through Breeding
331 - Management and Ecology of Irrigated Pastures in the Intermountain West
344 - Water Use and Growth of Selected Vegetables with Emphasis on Onions
345 - Reduction of Water Use in Turfgrass by Plant Improvement and Improved Management Strategies
352 - Pasture and Forage Research
353 - Impacts of Structural Change in the Dairy Industry
351 - Multidsciplinary Evaluation of New Apple Cultivars
735 - Breeding and Testing Improved Varieties of Barley, Spring Wheat, and Oats
743 - Cultural, Biological, and Chemical Control of Weeds in Field Crops
013 - Environmental and Economic Impacts of Nutrient Management on Dairy Forage Systems
023 - Identifying Markets and Market Niches for Utah Agricultural Products
785 - Improved Management Options for Cattle Ranches: Coping with Risk and Federal Rangeland Policy Change

Goal 2: To Provide a Safe and Secure Food and Fiber System

230 - Food Storage: Preserving Quality and Safety

Goal 3: To Achieve a Healthier, More Well-Nourished Population

214 - Nutrition and Risk of Osteoporotic Hip Fracture in Elderly Utah Residents
220 - Factors Influencing the Intake of Calcium Rich Foods Among Adolescents

Goal 4: To Achieve Greater Harmony Between Agriculture and the Environment

173 - Development of Co-Existing Livestock and Wildlife Enterprises in Aspen Landscapes
471 - Water Quality Issues in Poultry Production and Processing
861 - Waste Management for On-Farm Sustainability
941 - Land Use Strategies to Address Nitrate Contamination of Groundwater in the Sevier River Watershed
942 - Integrated Facultative Ponds (IFP) for Agricultural Waste Water Treatment
324 - Water and Solute Flow and Management as Related to Changes in Soil Physical Properties
338 - The Utilization of Municipal Sewage Sludge (Biosolids) for Irrigated Crop Production
431 - Sustainable Cropping Systems Utilizing Low-Cost Precision Agriculture Technology

442 - Water Management in Woody Landscape Plants
446 - Farm and Landscape Water Allocation and Conservation at the Rural:Urban Interface
335 - Western Regional Sustainable Agricultural Research and Education (SARE) Program
052 - Benefits and Costs of Resource Policies Affecting Public and Private Land
828 - A National Assessment of Wildlife Damage to American Agriculture
956 - Coyote Sterilization as a Method of Reducing Depredations on Domestic Lambs
958 - Effects of Range Manipulations and Grazing on Rangeland Productivity and Biodiversity
705 - Social and Biological Aspects of Community Forests
709 - The Economic Value of Open Space in the Intermountain West
726 - Social Equity and Ecosystem Mangement: Integrating Social Science in Resource Planning and Policy
737 - Integrating Human Dimensions into the Science and Management of Utah's Forest Ecosystems
229 - Developing Methods to Add Value to Agricultural By-Products
905 - Development of New Approaches to Rangeland Monitoring and Assessment of Condition and Trend
911 - Development of Economical Rangeland Monitoring Systems
919 - Constraints for Adoption of Improved Management Systems for Range Livestock Production on Private Land
923 - Applications of Behavioral Principles to Management

Goal 5: To Enhance Economic Opportunities and the Quality of Life Among Families and Communities

007 - Rural Communities and Public Lands in the West: Impacts and Alternatives
074 - Rural Economic Development: Alternatives in the New Competitive Environment
885 - Components of School Readiness and School Success for Children in Low-Income Mexican American Families in Rural Northern Utah
972 - Promoting Life Management Skills to Enhance Employment Among Family Support Service Recipients
973 - Rural Low-Income Families: Tracking their Well-Being and Functioning in the Context of Welfare Reform
985 - Family Business Viability in Economically Vulnerable Communities
839 - Social Change and Adaption Response to Shifting Sustenance Structures in Western Communities
841 - Interdependencies Among Community, Agriculture, and Social Change in Nonmetropolitan Utah
844 - Factors Influencing Willingness to Continue Family Farm Operations in Utah
847 - Western Rural Development Center
869 - Family and Work Linkages

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multi-state Extension Activities and Integrated Activities
(Attach Brief Summaries)

Institution Utah State University, Extension Service
State Utah

Check one:
x Multistate Extension Activities
____ Integrated Activities (Hatch Act Funds)
____ Integrated Activities (Smith-Lever Act Funds)

Estimated Costs

Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
Agronomy/Crops	$ 3212				
Livestock	$29881				
Youth and 4-H	$24038				
Economic Development Planning	$ 6508				
Business Retention and Expansion	$ 3212				
Total	$66851				

_____ _____
Director Date

Fund Audit Salary Tracking:
Alan Young
Ron Boman
Jim Keyes
Cynthia Zollinger
John Murphy