

PLAN OF WORK

UTAH STATE UNIVERSITY

AGRICULTURAL EXPERIMENT STATION

and

EXTENSION SERVICE

Two Year Addendum

October 1, 2004 – September 30, 2006

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**Utah Agricultural Experiment Station
and
Utah State University Extension**

Plan of Work

October 1, 2004 – September 30, 2006

SECTION I

STAKEHOLDER INPUT PROCESS:

Utah State University developed a collaborative plan of work for the state of Utah to begin in 1999. Beginning in early December 1998, the Utah Cooperative Extension Service (CES) and the Utah Agricultural Experiment Station (UAES) Plan of Work Team devised a plan that would insure stakeholder input at the country, regional, and state level. Stakeholders at each of these levels, including specialty commodity groups, community and regional leaders, extension and experiment advisory station committees, and lay citizens, were invited to participate in stakeholder meetings held in 28 Utah counties. Each year since that beginning effort, approximately 1/3 of the counties have been visited annually in follow-up stakeholder sessions. These meetings have annually involved between 100 and 350 stakeholders. These stakeholders participated 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.

Stakeholder input into the programs of Utah's Extension and Experiment Station is broad and varied. The elements of the Accountability in Action Program, Compact Planning, environmental scanning efforts, and advisory councils have all contributed to an open and fair process for stakeholder input in Utah.

SECTION II

PLAN OF WORK ADDENDUM

Goal 1 Addendum

Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

Extended Programs from FY2000 – FY2004

Extension Extended Programs from FY 2000-FY 2004 Plan of Work:

- Agronomy/Crop Production
- Alternative Agriculture and Markets
- Horticulture-Commercial Fruit and Vegetable Production
- Livestock
- Gardening and Ornamental Horticulture
- Sustainable Agriculture

Experiment Station Extended Programs from FY2000 – FY2004 Plan of Work:

There were no specific projects listed under Goal Area #1 in the 2000-2004 Experiment Station Plan of Work.

New Programs for FY2005 – FY2006

New Extension and Agricultural Experiment Station Integrated Programs

- Production Based Agriculture: Developing enhanced methods of agricultural production and marketing through scientific, research-based methods of investigation (*Integrated Program*)
- Production Based Agriculture: Utilizing biotechnology and genomics to improve agricultural productivity and profitability (UAES)
- Production Based Agriculture: Controlling invasive species through research and outreach activities (*Integrated Program*)
- Production Based Agriculture: Enhancing the efficiency and efficacy of agriculture information delivery methods (CES)
- Production Based Agriculture: Develop and Deliver current, research-based information on economically and environmentally sound agricultural production practices (*Integrated Program*)
- Production Based Agriculture: Develop programming to support small farm and ranch management (CES)

- Homeland Security: Develop an agro-security education and response program (CES)
- Homeland Security: Protect Utah’s agricultural security and productivity by delivering quality plant pest diagnostic and pest management services
(**Integrated Program with Invasive Species Program in UAES**)

Utah Extension and Agricultural Experiment Station Full State Plan of Work Goal 1 – October 1, 1999-September 30, 2006			
Program Title	Agronomy/Crop Production	Alternative Agriculture and Markets	Horticulture: Commercial Fruit and Vegetable Production
Program Duration	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period
Principle Program Goal	Crop varieties common throughout the region such as alfalfa, corn silage, grass hay, pasture, cereal grains cut for hay, barley, wheat, oats and grain corn will be field tested under regional environments. Improved practices and better yields is the major goal of the program.	Agriculture is in transition and alternative crops, methods and marketing needs to be evaluated. Alternatives will be explored with production of livestock, dairy, crops and production relationships to the environment.	An expansion of the fruit and vegetable production capabilities of Utah will be implemented in this program. Concentration will be on developing increased commercial production of onions, sweet corn, melons and pumpkins.
CSREES Goal Area, Funding Source	Goal 1: Smith-Lever 3(b) (1) and (c)	Goal 1: State Base	Goal 1: Smith –Lever 3(b) (1) and (c)
Unit Point of Contact	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882
Collaborating Unit(s)	CES Units in Idaho, Arizona, New Mexico, Wyoming, Colorado, Nevada	CES Units in Idaho, Arizona, New Mexico, Wyoming, Colorado, Nevada	CES Units in Arizona, Nevada and California
FTE*	CES: 1.51 FTE	CES: 1.50 FTE	CES: 2.80 FTE
Required Program Support (all sources)	CES: \$226,500 annually	CES: \$225,000 annually	CES: \$420,000 annually

*Professional FTE shown unless indicated otherwise.

**Utah Extension and Agricultural Experiment Station Full State Plan of Work
Goal 1 – October 1, 1999 – September 30, 2006**

Program Title	Livestock	Gardening and Ornamental Horticulture	Sustainable Agriculture
Program Duration	Long Term: Five Year Planning Period	Intermediate Term Five Year Planning Period	Intermediate Term Five Year Planning Period
Principle Program Goal	The majority of livestock receipts come from cow-calf operations, dairies and sheep but the future is grim because of economic considerations. This program will explore alternative marketing and production improvement strategies with dairy, swine, sheep, cattle producers, pasture owners and forage producers	Gardening and landscaping are popular activities in Utah. Providing information on best management practices, local growing requirements, new technologies will help save money, conserve water, improve food safety and protect water quality. Demonstrations, publications and outreach programs will be utilized in this program.	Maintaining our producers on the land, and in an economical, environmental and sustainable fashion, to enhance the ability of all consumers to enjoy a heightened quality of sustainable life for ourselves, families, communities, now and in the future is the goal of this program. Training of agents and others in sustainable agricultural techniques, principles and current research will be the primary focus
CSREES Goal Area, Funding Source	Goal 1: Smith –Lever 3(b) (1) and (c)	Goal 1: State Base	Goal 1: Smith-Lever 3(d)
Unit Point of Contact	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882
Collaborating Unit(s)	CES Units in Idaho, Arizona, New Mexico, Wyoming, Colorado, Nevada	CES Units in Idaho, Wyoming, Nevada	CES Units in Wyoming, Nevada
FTE*	CES: 2.49 FTE	CES: 4.15 FTE	CES: 4.0 FTE
Required Program Support (all sources)	CES: \$373,500 annually	CES: \$622,500 annually	CES: \$600,000 annually

*Professional FTE shown unless indicated otherwise.

**Utah Extension and Agricultural Experiment Station Full State Plan of Work
Goal 1 – October 2004 – September 30, 2006**

Program Title	Production Based Agriculture: Developing enhanced methods of agricultural production and marketing through scientific, research-based methods of investigation.	Production Based Agriculture: Utilizing biotechnology and genomics to improve agricultural productivity and profitability	Production Based Agriculture: Controlling invasive species through research and outreach activities. (This has been integrated with a UAES program area as noted later.)
Program Duration	Long Term: seven or more years	Long Term: seven or more years	Long Term: seven or more years
Principle Program Goal	To assist existing and potential agricultural producers optimize the use of their resource base	To utilize biotechnology and genomics in solving agriculture's production, disease, and marketing problems.	To limit extent to which invasive species (both plants and animals) impact existing and potential agricultural production through research and outreach activities.
CSREES Goal Area Funding Source	Goal 1 Smith-Lever 3(d); Hatch; State	Goal 1 Hatch; State; Private Sources	Goal 1 Smith-Lever 3(d); Hatch; State
Unit Point of Contact	Dr. H. Paul Rasmussen, Director, AES Phone (435) 797-2282 Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882	Dr. H. Paul Rasmussen, Director, AES Phone (435) 797-2282	Dr. H. Paul Rasmussen, Director, AES Phone (435) 797-2282 Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882
Collaborating Unit(s)	CES, UAES, Utah State University's colleges, Utah Departments of Agriculture and Food and Natural Resources, USDA	Utah State University's Colleges, Utah Department of Agriculture and Food, USDA, Commercial biotechnology companies	CES, UAES, Effective and close collaboration with all PPDL partners including the UDAF, Utah State University Biology Department; Utah Departments of Agriculture and Food and Natural Resources, USDA, Homeland Security, DOD
FTE*	CES: ____ UAES: Hatch - 1.2; Multistate - 1.7; State - .02	UAES: Hatch - 1.44; Multistate - .69; State - .03	CES: ____ UAES: .75 professional
Required Program Support (all sources)	CES: ____ UAES: Hatch - \$117,375 Multistate - \$183,170 State - \$508,017	UAES: Hatch - \$160,533; Multistate - \$162,178 State - 458,565	CES: ____ UAES: Hatch - \$40,342 Multistate - \$0.00 State - \$72,791

*Professional FTE shown unless indicated otherwise.

Utah Extension and Agricultural Experiment Station Full State Plan of Work
Goal 1 – October 2004 – September 30, 2006

Program Title	Production Based Agriculture: Enhancing the efficiency and efficacy of agriculture information delivery methods.	Production Based Agriculture: Develop and deliver current, research-based information on economically and environmentally sound agricultural production practices.	Production Based Agriculture: Develop programming to support small farm and ranch management.
Program Duration	Long Term: two or more years	Long Term: seven or more years	Long Term: two or more years
Principle Program Goal	Maintaining our producers on the land, and in an economical, environmental and sustainable fashion, to enhance the ability of all consumers to enjoy a heightened quality of sustainable life for ourselves, families, communities, now and in the future is the goal of this program. Training of agents and others in sustainable agricultural techniques, principles and current research will be the primary focus	Utah State University's Experiment Station will continue to conduct research to provide CES with research-based information. Extension will continue to deliver research-based information to Utah agriculture and livestock producers through its network of agents and specialists. This program represents Extensions commitment to improve this service as these industries evolve through research-based information on economically and environmentally sound agriculture production.	This program involves a structured and integrated approach to develop a small farm/ranch program led by an issue team that will identify needs and opportunities to deliver information to this audience, and then initiate an ongoing program to support small farm and ranch owners in Utah.
CSREES Goal Area Funding Source	Goal 1: Smith-Lever 3(d)	Goal 1: Smith-Lever 3(d); Hatch; State	Goal 1: Smith-Lever 3(d)
Unit Point of Contact	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882 Dr. H. Paul Rasmussen, Director, AES Phone (435) 797-2282	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882
Collaborating Unit(s):	CES in surrounding states	Utah Department of Agriculture and Food, USDA, CSREES	CES in surrounding states
FTE*	CES: 2.80	CES: ____ UAES: Hatch - 1.30 Multistate - .34 State - .70	CES: 2.80
Required Program Support (all sources)	CES: \$420,000	CES: ____ UAES: Hatch - \$146,887 Multistate - \$26,192 State - \$465,251	CES: \$420,000

*Professional FTE shown unless indicated otherwise.

Utah Extension and Agricultural Experiment Station Full State Plan of Work
Goal 1 – October 2004 – September 30, 2006

Program Title	Homeland Security: Develop an agro-security education response team	Homeland Security: Protect Utah's agricultural security and productivity by delivering quality plant pest diagnostic and pest management services.
Program Duration	Long Term: two or more years	Long Term: two or more years
Principle Program Goal	Formation of a statewide agro-security task force under the leadership of Extension and involving the main agricultural commodity groups and Utah Department of Agriculture and Food is the center piece of this program. The task force will be in charge of developing an agro-security response plan, identifying specialized training and education needs, and developing programs.	Effective and close collaboration with the Colleges of Agriculture and Science, all PPDL partners including the UDAF, Utah State University Biology Department, extension agents, and specialists in meeting the needs for accurate, timely and cost effective diagnosis and overall management recommendations in the areas of plants and insects.
Program Title	Homeland Security: Develop an agro-security education response team	Protect Utah's agricultural security and productivity by delivering quality plant pest diagnostic and pest management services. (Homeland Security)
Program Duration	Long Term: two or more years	Long Term: seven or more years
Principle Program Goal	Formation of a statewide agro-security task force under the leadership of Extension and involving the main agricultural commodity groups and Utah Department of Agriculture and Food is the center piece of this program. The task force will be in charge of developing an agro-security response plan, identifying specialized training and education needs, and developing programs.	Effective and close collaboration with all PPDL partners including Colleges of Agriculture and Science, the UDAF, Utah State University Biology Department, extension agents and specialists in meeting the needs for accurate, timely and cost effective diagnosis and overall management recommendations in the areas of plants and insects.
CSREES Goal Area, Funding Source	Goal 1: Smith-Lever 3(d)	Goal 1: Smith-Lever 3(d); Hatch; State
Unit Point of Contact	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882	Dr. Clell Bagley Extension Program Leader, ANR Phone (435) 797-1882 Dr. H. Paul Rasmussen Director, UAES Phone (435) 797-2282
Collaborating Unit(s)	CES in surrounding states, USDA, Homeland Security, DOD	CES in surrounding states, USDA, CSREES
FTE*	CES: 2.80	CES: 2.80 UAES: .75 professional
Required Program Support (all sources)	CES: \$420,000	CES: \$420,000 UAES: Hatch - \$40,342 State - \$72,971

*Professional FTE shown unless indicated otherwise.

New Program Areas Under Goal 1

Program Title:

Production Based Agriculture: Developing enhanced methods of agricultural production and marketing through scientific, research-based methods of investigation.

Statement of Issue(s):

Agriculture in Utah is a billion dollar industry. It faces numerous challenges including production and marketing risks. The purpose of this program is to continued developing means to enhance production and marketing efficiency and efficacy.

Performance Goal(s):

Improve production efficiencies for both crops and livestock.

Reduce production and marketing risks through alternative production and marketing methods

Key Program Components:

Research will focus on livestock production systems, plant production systems, and overall marketing systems for agricultural products. Of primary concern is the economic impact of various instruments or changes in practice.

Internal and External Linkages:

Internal - Scientists from the departments of Animal, Dairy and Veterinary Sciences; Economics; Plants, Soils, and Biometeorology; Nutrition and Food Science, and Agriculture Systems Technology will contribute in meeting these goals. Cooperative Extension will play a key role in assisting in the identification of needs and potential partners, as well as be instrumental in the outreach effort.

External - Public and private partnerships will be developed and maintained to better meet these goals. Outside private entities will include commodity groups, farm representative organizations, individual producers, and agribusiness firms. Public-Public partnerships will include the Utah Department of Agriculture and Food, the Bureau of Land Management, the USDA's Forage and Range Research Laboratory, the USDA's Poisonous Plant Laboratory, and the Forest Service.

Target Audience(s):

Primarily farmers and ranchers involved in either crop production or livestock production.

Evaluation Framework:

Factors influencing crop and livestock productivity will be identified relative to their effect on physical output and marketability.

Output Indicator(s):

Identification of potential technologies that have the potential to impact production and/or marketing efficiencies. Development of application methods necessary to allow adoption and implementation.

Outcome Indicator(s):

Identifying increases in production and/or profitability by 5% for a select number of crops (hay, barley, and wheat) and animal (beef and dairy) products.

Program Duration:

This program is long-term, i.e., more than 7 years.

Allocated Resources:

Extension FTE's: _____

\$_____

Experiment Station FTE's: Hatch - 1.27; Multistate - 1.71; State - .02

Hatch: \$117,375; Multistate - \$183,170; State - \$508,017

Education and Outreach Program(s):

Experiment station scientists will work with Extension specialists and county agents in developing and preparing materials for farm and ranch operators.

Points of Contact:

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Program Title:

Production Based Agriculture: Utilizing Biotechnology and Genomics to Improve Agricultural Productivity and Profitability

Statement of Issue(s):

The Earth is a complex web of diverse ecological communities that are controlled by numerous organisms and their interactions. Research related to biotechnology and genomics is opening doors to improving the diversity and strength of aquatic, animal, and plant communities. Understanding these genomic processes is critical to our ability to effectively manage and manipulate plant and animal populations. Applications of this work include healthier and more efficient agricultural practices.

Performance Goal(s):

Improve health efficiencies of plant and animal agricultural-related organisms. Reduce crop and livestock losses due to poor health or disease.

Key Program Components:

Research will focus on commercially viable crop and livestock products.

Internal and External Linkages:

Internal: Scientists from the Departments of Animal, Dairy, and Veterinary Sciences; Plants, Soils, and Biometeorology; Nutrition and Food Science; and Biology will assist in meeting the stated goals.

External: Public and private partnerships will be developed and maintained to better meet these goals. Outside private entities will include biotechnology and genomics companies. Scientists from other universities will also be involved, as will those from ARS and other public agencies.

Target Audience(s):

While the eventual target will be farmers and ranchers, the intermediate target will be other scientists who will assist in the application of these technologies. This would include those scientists and specialists that are involved with applications of basic science.

Evaluation Framework:

Those practices that are deemed to be the most relevant to the actual application of biotechnology will be pursued initially.

Output Indicator(s):

Identification of potential applications will be made on a 3-year basis.

Outcome Indicator(s):

Identification of at least two short-term (within 2 years) biotechnology conversions will be made by the end of the current Plan of Work framework, i.e., FY2006.

Program Duration:

This will require a very long-term investment in total, though specific applications of biotechnology are assumed to become available within the next 5 years.

Allocated Resources:

Extension FTE's: _____

\$ _____

Experiment Station FTE's: Hatch - 1.44; Multistate - .69; State - .03
Hatch - \$160,533; Multistate - \$162,178; State - \$458,565

Education and Outreach Programs:

Although this will involve much basic science, there is an outreach component that is directly made available through the “outreach” staff of the Center for Integrated Biology (CIB),” the on-campus center for biotechnology and genomics work. In addition, materials from the CIB staff will be made available to extension specialists and agents.

Points of Contact:

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Logan, Utah 84322-5600
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Program Title:

Production Based Agriculture: Controlling Invasive Species Through Research and Outreach Activities. (**Integrated Program Related to Homeland Security**).

Statement of Issue(s):

Numerous plant and animal production programs or operations, as well as community biosystems, are being devastated by invasive species including weeds and other plants, insects, diseases, and even some animal species. This is particularly a problem for federal and state lands and related resources (i.e., wild game, forest lands, general grazing lands, etc.).

Performance Goal(s):

To identify specific approaches and methodologies that can be used to combat invasive species including both plant and animal organisms.

Key Program Components:

The research related to this program will involve (a) identifying the broad list of known invasive species—both plant and animal, (b) prioritizing the species list by those having the greatest potential to disrupt agriculture and natural resource systems, and (c) identifying alternative approaches to resolving problems related to invasive species.

Internal and External Linkages:

Internal - Scientists from the departments of Animal, Dairy and Veterinary Sciences; Economics; Plants, Soils, and Biometeorology; Agriculture Systems Technology, Biology, as well as assistance from the College of Natural Resources, will contribute in meeting these goals. Cooperative Extension will play a key role in the outreach effort.

External - Public and private partnerships will be developed and maintained to better meet these goals. Outside private entities will include commodity groups, farm representative organizations, individual producers, and agribusiness firms. Public-Public partnerships will include the Utah Department of Agriculture and Food, the Bureau of Land Management, USDA's APHIS, the USDA's Poisonous Plant Laboratory, and the Forest Service.

Target Audience(s):

The target audience most certainly includes farmers and ranchers, but extends to rural and urban residents. The entire ecosystem (including humans) is being impacted by these plants, animals, or diseases.

Evaluation Framework:

Crops and livestock, as well as community, damages will be used to determine the effectiveness of this program.

Output Indicator(s):

Invasive species will be ranked according to potential damage given existing knowledge regarding impacts and effects; High priority species will be targeted for intervention; Protocols will be developed that will facilitate a successful fight against these various invading species; and Priority invasive species will be controlled.

Outcome Indicator(s):

A reduction in the actual number and extent of currently identified invasive species.

Program Duration:

This program is, of necessity, long-term, up to seven years from project initiation.

Allocated Resources:

Extension FTE's: _____

\$ _____

Experiment Station FTE's: Hatch: .75 professional

Hatch - \$40,342; Multistate - \$0.00; State - \$72,971; Other - \$94,435 (Total: \$207,748)

Education and Outreach Programs:

A united effort will be required on the part of the Agricultural Experiment Station and the Cooperative Extension Service in combating this invasion. The effort will include the identification of problem areas, research conducted into best management practices for combating the respective invading species, and the development and preparation of materials outlining best management practices intended for farmers, ranchers, and rural and urban community members.

Points of Contact:

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Program Title:

Production Based Agriculture: Enhancing the Efficiency and Efficacy of Agriculture Information Delivery Methods.

Statement of Issue(s):

Delivery mechanisms for agriculture and livestock production information must reflect the needs and abilities of the clientele and also be efficient in terms of committing limited Extension personnel and fiscal resources. Traditional methods of face-to-face and printed material delivery must be evaluated to determine if they are the most efficient or sole method of delivery needed both statewide and on a regional basis considering changes in technology and producer demographics.

Face to face delivery. The model of annual county-based crop and livestock schools needs reassessing. In many counties less than five producers may attend a program. Yet, well over 100 producers will attend the Utah Hay Growers meeting held every other year. Scheduling, advertising, content and other issues need to be assessed and a mechanism devised to improve the efficiency of this delivery mechanism and promote producer attendance at the meetings. Other states have adopted an integrated approach to information delivery where producers travel to centralized locations for more comprehensive (e.g., integrated forage production-utilization schools) and longer duration sessions. Regional or statewide producer programs may be more efficient than county-based programs in all or parts of Utah. Additional opportunities may also exist to partner with other state and federal agencies, as well as commodity groups, to reach producers during other established programs.

Print and electronic media delivery. Historically, printed materials have been the foundation of Extension information delivery. As the public develops computer literacy skills and gains access to the Internet, electronic delivery of information and educational programs will increase. Enhanced and dynamic issue-oriented web offerings, electronic bulletins and fact sheets, and enhanced electronic communication (e.g., e-mail, satellite) opportunities are necessary to expand Extension's outreach capabilities in the production agriculture area. To facilitate electronic delivery, mechanisms are needed to insure quality of materials produced, and to promote professional credibility and credit for these efforts. A uniform

system of standards for electronic programming must be developed and accepted by the University promotion and tenure system and relevant committees. Printed and electronic information must regularly be evaluated and kept current. Large stocks of printed materials occupy shelves in the Extension bulletin room. These materials are typically not updated until stocks are depleted and reprinting is required; consequently, many of the materials are outdated. Electronic publications offer the advantage of rapid updating with no capital investment in printing, storage, or management. Extension will explore more electronic options for bulletins and fact sheets, such as web-based and print on demand technologies, to reduce stocks of printed documents. Regardless of whether a publication is printed or available only in electronic form each should have a “sunset date” or mandatory revision date to insure the information is kept current.

Performance Goal(s):

Traditional methods of face-to-face and printed material delivery for agriculture and livestock production information must be efficient and timely to meet the changes in producer demographics and to stay technologically attune to the needs of an information driven society.

Key Program Components:

Enhance electronic delivery of Extension information by developing web sites targeted to major agricultural commodities; enhance electronic delivery by establishing uniform standards for review and acceptance of electronic materials; review current stocks of printed materials for relevancy, age, and organization; and establish a “sunset date” (mandatory revision or elimination date) for all agricultural publications.

Internal and External Linkages:

Internal linkages include close collaboration with Extension authors, specialists, agents and multi-state collaboratives involved in the publication and face to- face delivery of Extension research based information.

Target Audiences:

Consumers of Extension publications and face to face delivery recipients including agriculture producers, agencies, governmental units, families and individuals are the intended audience of these outreach driven revisions.

Evaluation Framework:

Standards for publication design and delivery whether print or electronic will be established and reviewed by contributing authors and writers.

Output Indicator(s):

Monthly maintenance and updating of web sites consistently accomplished; Track web site hits to determine use and usefulness of the site from producers and other users; An organized collection of relevant printed materials; updated catalog of printed materials is readily available to customers; and A sunset date for all current and future agriculture

publications is established and applied to all Extension publications.

Outcome indicator(s):

Two additional web topical areas developed each year and A uniform policy on peer review, acceptance, and professional (promotion and tenure) credit for electronic material is established and accepted by the university at large.

Program Duration: Long term two or more years.

Allocated Resources:

Extension FTE's: 2.80
Smith-Lever - \$420,000

Education and Outreach Programs:

Planners and authors of Extension and other relevant publications and programs will develop new protocols for providing research based information to the publics historically served by Utah State University Extension. Workshops and seminars will be utilized in training Extension staff in techniques reflective of the initiatives engendered in this program.

Point of Contact:

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Extension Program Leader Agriculture,
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Program Title:

Production Based Agriculture: Develop and Deliver Current, Research-Based Information on Economically- and Environmentally-Sound Agricultural Production Practices. (**Integrated Program**)

Statement of Issue(s):

Pursuant to the land grant mission of Utah State University, the Experiment Station develops sound, scientific solutions to existing problems and Extension delivers research-based information to Utah agriculture and livestock producers through its network of agents and specialists. This program represents a commitment to serve the production agriculture industries in Utah and to improve this service as these industries evolve through research-based information on economically and environmentally sound agriculture production practices. Agriculture Extension specialists are housed in academic departments and many also hold partial research appointments through the Agricultural Experiment Station, thereby insuring close ties with cutting edge agricultural

research and technology advancements. Agriculture Extension agents are housed in every county and are supported by this network of specialists in the form of regular in-service training and professional development, written materials (bulletins and fact sheets), and participation in county-based applied research activities.

Performance Goal(s):

Develop and Deliver current, research-based information to Utah agricultural producers and Assess the economic impact of Extension agriculture programs in the state of Utah.

Key Program Components:

Ongoing reviews of FTE assignments by agriculture sector and review of educational material relevancy will be instituted; All current educational materials will be reviewed with respect to relevancy, timeliness, and new information needs; Information gaps will be identified by the agriculture sector; and A uniform metric or standard will be developed to assess the economic impact of assistance provided to agriculture and livestock producers.

Internal and External Linkages:

The collaborative efforts of all Utah State University academic department specialists working in conjunction with agriculture agents and Experiment Station scientists will be necessary to fulfill this program. Identification of potential outcomes and impact will be solicited from agriculture producers, farm and ranch agencies and organizations. Measures reflecting the value of research (i.e., number of times an article is cited, etc.) will also be developed.

Target Audiences:

Other scientists, agricultural producers; extension specialist and agent personnel servicing agriculture producers; and commodity groups.

Evaluation Framework:

Quantify the number of educational programs, producers attending programs, and satisfaction levels with information provided. Appropriate specialists and agents will be identified to develop new materials with appropriate evaluation protocols. The effectiveness as measured by publications and presentations will be utilized in the evaluation of Experiment Station efforts.

Output Indicator(s):

Twenty new Extension publications (bulletins or fact sheets) are delivered each year. Annual reports by project and goal area by Experiment Station scientists including useful *Impact Statements*.

Outcome indicator(s):

Annual assessment of economic impact of Extension and Experiment Station agriculture programs will be conducted.

Program Duration:

Long Term - seven or more years.

Allocated Resources:

Extension FTE: _____

\$_____

Experiment Station FTE: Hatch - 1.3; Multistate - .34
Hatch - \$146,887; Multistate - \$26,192; State - \$465,251

Education and Outreach Programs:

Identification of publication and research needs will continue to be identified through stakeholder listening sessions and ongoing state and county Extension advisory councils and the Agricultural Experiment Station's advisory council providing input to meet the needs for research based programs and publications.

Points of Contact:

Dr. Clell V. Bagley
Extension Program Leader Agriculture,
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E-mail: paul@agx.usu.edu

Program Title:

Production Base Agriculture: Develop Programming to Support Small Farm and Ranch management.

Statement of Issue(s):

The number of small farms and ranches in Utah is growing. Larger farms are being fragmented and sold into smaller "ranchette" properties. Much of this fragmented development is occurring at urban-rural interface areas along the Wasatch Front and has a direct impact on green space. Small farm and ranch owners commonly desire a more rural lifestyle for themselves and their families, but continue to work in urban areas and in careers unrelated to agriculture. Owners may not have an agricultural background and therefore may not understand legal and management issues surrounding the ownership of farm property and livestock. Assistance in areas like noxious weed control, odor, water rights, water quality, and basic crop and livestock management is needed. Small farm and ranch owners represent a growing client base for Extension in Utah and an audience that differs from traditional, whole-income farm and ranch owners. Since financial support for the small farm or ranch may come primarily from an off-farm employment, decisions are not made entirely based on economic considerations. Due to employment commitments, opportunities for reaching small farm and ranch owners also differ from

traditional agriculture audiences. In some respects this client base is similar to that served by in horticulture by the Master Gardener program, and approaches to reaching the small farm/ranch audience may need to resemble those in this successful program.

Performance Goal(s):

This program involves a structured and integrated approach to develop a small farm/ranch program led by an issue team that will identify needs and opportunities to deliver information to this audience, and then initiate an ongoing program to support small farm and ranch owners in Utah.

Key Program Components:

Establish small farm/ranch issue team composed of specialists and agents in appropriate discipline and geographic areas; **Issue** team will survey and assess the needs of small farm/ranch client needs; and **Develop** a coordination protocol for the development of small farm and ranch management programming.

Internal and External Linkages:

Extension customers who are owners or managers of small farms and ranches primarily in urban and suburban areas will interact with Extension agriculture agents, specialists and other members of the agriculture education community. Governmental agencies including NRCS, Farm Service agency and state agencies including the Utah Department of Agriculture and Foods will collaborate in the design development and identification of the potential needs of this group.

Target Audience(s):

Small farm and ranch owners in the suburban and urban counties of Utah to include, Utah, Salt Lake, Davis, Weber, Box Elder and Washington Counties.

Evaluation Framework:

Customer satisfaction levels of small farm and ranch owners will be evaluated following programs developed and designed to meet the needs identified of these groups.

Output Indicator(s):

Small farm/ranch issues team is established and meets on a periodic basis; Completed small farm/ranch program needs assessment; Two publications per year addressing small farm and ranch management issues; and Two educational programs per year on small farm and ranch management in appropriate geographical and content areas.

Outcome indicator(s):

Satisfaction levels with Utah Extension in meeting the needs of small farm and ranch owners increases and Small farm and ranch owners develop increased proficiencies at management of properties in urban and suburban settings

Program Duration: Long Term - two or more years.

Allocated Resources:

Extension FTE's: 2.80
\$420,000

Education and Outreach Programs:

Planned activities will probably include tours, field days, demonstration plots and seminars to assist the small farm and ranch community with many aspects of agricultural improvement, cultural practices and related issues identified.

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Program Title:

Homeland Security: Develop an Agro-Security Education and Response Program

Statement of Issue(s):

Agriculture is the most basic of all industries in Utah and is the economic core for families and communities throughout rural areas of the state. However, issues such as lower economic returns to producers, a rapidly evolving industry, increased urbanization, agro-security, environmental quality, and a lack of awareness (interest) among the general population threaten the existence of the core agriculture industry. Changes and challenges in the Utah agricultural industry demand a dynamic response from Utah State University University Cooperative Extension. Extension must continue to respond to core industry needs while at the same time developing mechanisms to assess, anticipate, and respond to new needs and issues in a timely and efficient manner.

Following the events of September 11, 2001, many questions have arisen regarding the security of America's food supply. Both crop and livestock industries are susceptible to natural biological and bio-terrorism threats. A greater awareness of potential agro-terrorism threats and bio-security measures in agriculture is necessary to forestall any widespread crop and livestock damage. Many believe that acts of terrorism now pose real threats to U.S. agriculture production and food distribution systems. The ability to identify threats and respond with sound containment and control measures will be critical to safeguard the food supplies and future production potentials. Utah State University Extension will be a leader in the identification of, and response to, agro-security issues concerning agriculture. Extension will play a key role as a front line agency involved in identifying agro-security issues and breaches, developing a response plan, and educating producers and the general public in communities on how to be proactive in prevention,

response to, and containment of outbreaks. Emergency outbreaks could take the form of pest and/or disease outbreaks in crop or livestock production systems.

Rapid recognition and diagnosis will be an important first step in the response and containment of an attack. Recognition will require qualified staff and technicians in appropriate diagnostic fields. Once identified, an organized and appropriate response will be needed. Agricultural producers will likely be the first responders in the event of an agro-terrorist attack. As such, education and training in recognition and initial response measures will be necessary. Specialized training in bio/agro-security for agents will also be necessary and would be the responsibility of the task force. The Utah Veterinary Diagnostic Laboratory (UVDL) is pursuing national accreditation by the American Association of Veterinary Laboratory Diagnosticians (AAVLD). Currently, the UVDL is the only state diagnostic laboratory in the Intermountain West that is not accredited. To achieve accreditation requires the presence of specific board certified personnel and accompanying support staff. Additional personnel will both allow the UVDL to undergo accreditation review and expand diagnostic services to detect agro-terrorist attacks aimed at livestock. Utah Extension has been asked to work with Colorado State University and other land grant universities in the Intermountain West on this program area creating a multi-state response to this critical agricultural issue.

Performance Goal(s):

Formation of a statewide agro-security task force under the leadership of Extension and the Agricultural Experiment Station involving the main agricultural commodity groups and Utah Department of Agriculture and Food is the center piece of this program. The task force will be in charge of developing an agro-security response plan, identifying specialized training and education needs, and developing programs. The UDAF holds the regulatory authority which will have to be sued in response to an outbreak. Extension and the Agricultural Experiment Station will Prepare to respond to outbreaks and counteract terrorism; Build secure communities; Address immediate security needs; and Educate scientists, teachers and specialists.

Key Program Components:

Develop an agro-security response task force with representatives from appropriate Extension and Agricultural Experiment Station specialty areas, state and federal agencies, and commodity groups; Develop agro-security response plan for appropriate agricultural industries (crop, livestock, food processing, etc.); Develop agro-security training program for Extension agents; and Develop agro-security training program and supporting documentation for crop and livestock producers.

Internal and External Linkages:

The agriculture community in Utah, including the Farm Bureau, Farmers Union, Utah Department of Agriculture and Food and other Utah based USDA partners, will collaborate in developing response and outreach programs to educate and inform agricultural producers, the agricultural community, and regional and county emergency

response teams on issues and appropriate responses to insure agro-security in Utah and the intermountain west.

Target Audience(s):

Agricultural producers; State, Federal and local agency personnel servicing producers; Commodity groups; and Veterinarians and state Extension agents and specialists;

Evaluation Framework:

The ability of the agricultural community to respond and remediate potential agro-security breaches will provide real-time measures of this program's effectiveness. Educational programs will be developed and measured for program outcomes.

Output Indicator(s):

Task force put into place and led or assisted by Extension specialists or Experiment Station scientists in main agro-security areas of livestock, crops and food processing; Develop a response plan (UDAF already has basic plans and is the only agency with authority to implement.); and Complete initial and annual training sessions.

Outcome Indicator(s):

Put in place an *Agro-security/bio-security* training program and Identify and develop supporting documentation and materials.

Program Duration:

On-going over the full cycle of this extended plan 2004-2006.

Allocated Resources:

Extension FTE's: 2.80
\$420,000

Education and Outreach Programs:

Ongoing activities will include tours, workshops, seminars, clinics, web-based support materials development, updates on UEDEN, and related issues identified by stakeholders, federal and state agencies charged with agro-security education and preparation.

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Program Title:

Homeland Security: Protect Utah's Agricultural Security and Productivity by Developing and Delivering Quality Plant and Animal Pest Diagnostic and Pest Management Services. **(Integrated Program)**

Statement of Issue(s):

The provision of research-based control methods and plant and animal pest diagnostic services to Utah's agricultural and green industries and homeowners plays a key role in maintaining safe and profitable plant production in the state. Utah State University Extension and the Agricultural Experiment Station provide the only state plant pest diagnostic services for Utah's citizens. Currently, state funding of the lab does not meet the full spectrum of diagnostic needs, especially with increased needs for agriculture bio-security. The Vet Diagnostics Laboratory, which operations under the Experiment Station but funded through the Utah Department of Agriculture and Food, is working towards full accreditation and presently handles most vertebrate animal diagnostic needs. Extension will continue to provide complete plant pest diagnostic services and provide documentation of plant health to maintain open export markets. The Utah State University Extension Plant Pest Diagnostic Laboratory (PPDL) is located in the Biology Department and has provided timely and accurate diagnoses of plant pests (arthropods and diseases) to Utah's citizens for approximately 20 years. Plant and animal pest diagnostic services are essential to maintaining agricultural bio-security and open export markets for Utah agricultural products through phytosanitary certification and meeting quarantine pest regulatory requirements, providing accurate identification of plant health problems that facilitate use of effective and timely controls, reducing use of toxic pesticides through promotion of alternative integrated pest management (IPM) strategies, and contributing to cost savings for agricultural and homeowner producers through protection of plant health.

Performance Goal(s):

Effective and close collaboration with the Vet Diagnostics Laboratory and all PPDL partners including the UDAF, Utah State University Biology Department, extension agents and specialists and Agricultural Experiment Scientists in meeting the needs for accurate, timely and cost effective diagnosis and overall management recommendations in the areas of plants and insects. Similar comments apply to the Experiment Station's animal diagnostic laboratories in Logan and in Nephi; Current and relevant educational training programs to serve the needs of producers, extension agents and other stakeholders; Updated and user friendly web site development and utilization by producers and other stakeholders; Success in obtaining appropriate state and other source funding to expand the efforts of the Vet Diagnostic Laboratories and PPDL to meet the expanded needs for disease, plant, and insect identification in the livestock, turf, ornamentals, forage crops, vegetables and rangeland crops areas.

Key Program Components: The Vet Diagnostic Laboratories operated under the direction of the Utah Agricultural Experiment Station contain the latest technologies in pathogen diagnostic services. The PPDL diagnostic services program includes digital

and electronic communications to traditional diagnostic samples provided by the Green Industry, homeowners, agents and other stakeholders. Plant diagnosticians supervised by Extension specialists with expertise in agricultural plant pathology, process samples (culturing diseases, using taxonomic keys, seeking taxa expertise, etc) diagnoses and delivery of accurate identifications and control recommendations. In addition, to the disease and plant invasive species, there are also insects that have invaded the state and an effort to identify those with the greatest threat and most likely to respond to treatment(s) will be examined and the efficacy of alternative means of control will be evaluated to find those treatments with the highest potential to eliminate or control these invasive species: plants, animals, diseases, and insect and other pests.

Internal and External Linkages:

Collaboration with the Agricultural Experiment Station, Utah State University's Biology Department and the Utah Department of Agriculture and Food are critical to the success of this program.

Target Audience(s):

Green industry producers; Utah Department of Agriculture and Food; Extension agents, Master Gardener groups; homeowners; and agriculture producers.

Evaluation Framework:

Customer satisfaction from users of the Vet Diagnostics Laboratories and the PPDL will provide evaluative feedback on meeting the needs of UDAF, the Green Industry, agents, homeowners and other stakeholders. The number of samples processed the communication protocols established with federal and state agencies, the number of fact sheets produced and the economic indicators of savings to users of the program will further anchor the evaluation.

Output Indicator(s):

The successful filling of the positions for an Extension Pathologist, Extension Entomologist and an Extension Biology staff, along with continued support of scientists from the Utah Agricultural Experiment Station. The routine delivery and timely delivery of plant pest diagnoses to extension agents and the public. The successful development of a memorandum of agreement with the Utah Department of Agriculture and Food. Timely plant pest surveillance programs as needed to target new, invasive, and exotic pests. Effective outreach education via diagnoses, web sites, fact sheets, and training sessions conducted both face to face and via satellite. The effectiveness of the liaison efforts between state and federal agencies for the identification of new, invasive and exotic pests.

Outcome indicator(s):

Federal and state agency collaboration on creating, maintaining and supporting the Utah PPDL. Economic savings to producers based on sound management recommendations from the PPDL.

Program Duration:

Long term - two or more years.

Allocated Resources:

Extension FTE's: 2.80

\$420,000

Experiment Station FTE's: .75 professional total from Hatch, State, and Other Sources
Hatch: \$40,342, Multi-state: \$0.00; Other: \$72,971

Education and Outreach Programs:

Activities include workshops, seminars, clinics, development of web-based support materials, fact sheet development and other publications, and related diagnostic issues identified by stakeholders, federal and state agencies charged with agro-security – plant and insect education, diagnostics and management recommendations.

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Goal 2 Addendum

To ensure an adequate food and fiber supply and food safety through improved science-based detection, surveillance, prevention, and education.

Extended Programs from FY 2000-FY 2004 Plan of Work

Extension Extended Programs:

- A Safe and Secure Food and Fiber System
- Integrated Pest Management
- Utah Pesticide Impact Assessment Program

Experiment Station Extended Programs:

- Plant and Animal Health and Safety

New Programs for FY2005 – FY 2006 Plan of Work

Experiment Station New Program

- Safe and Secure Food and Fiber System (**Integrated Program**)

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 2 – October 1, 1999-September 30, 2006**

Program Title	Safe and Secure Food and Fiber System	Integrated Pest Management	Utah Pesticide Impact Assessment Program
Program Duration	Long Term: Five Year Planning Period. Food Safety Manager Training – immediate duration	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period
Principle Program Goal	This program 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. Educational programs will assist producers and consumers in wise management of resources and reduction of waste.	Commercial efforts with producers of fruit, small grains, forage crops and onions have been targeted for IPM. The development and evaluation of alternative IPM tools will be explored. Increased emphasis will be placed with homeowner IPM training.	The purpose of the State Pesticide Impact Assessment Program (PIAP) is to provide the most objective and accurate data available for defining and evaluating the benefits and risks of selected pesticides having critical agricultural and forestry uses. The program is designed to promote informed regulatory decisions concerning registered pesticides.
CSREES Goal Area, Funding Source	Goal 2: Smith-Lever 3 b (1) and c	Goal 2: Smith-Lever 3(d)	Goal 2: Smith –Lever 3(d)
Unit Point of Contact	Dr. Charlotte P. Brennand Utah State University, Nutrition and Food Sciences, Phone (435) 797-2116	Dr. Diane Alston, Utah State University Extension Entomology Specialist, Phone (435) 797-2516	Dr. Howard Deer, Utah State University Center for Environmental Toxicology, Phone (435) 797-1602
Collaborating Unit(s)	CES Units in Nevada, New Mexico, Arizona, Colorado and Wyoming		Coordination with numerous state and federal regulatory agencies. Western tri-states weed board and western states regional IPM conference.
FTE*	CES: 3.49	CES: 3.5	CES: 1.5
Required Program Support (all sources)	CES: \$532,500 annually	CES: \$525,000 annually	CES: \$225,000 annually

*Professional FTE shown unless indicated otherwise.

<p style="text-align: center;">Utah State University Extension and Agricultural Experiment Station Full State Plan of Work Goal 2 – October 1, 1999-September 30, 2006</p>	
Program Title	Plant and Animal Health and Safety
Program Duration	Long Term: - five or more years
Principle Program Goal	Protect animal and plant health and safety to provide a safe and secure food system for the U.S.
CSREES Goal Area, Funding Source	Goal 2
Unit Point of Contact	H. Paul Rasmussen, Director Utah Agricultural Experiment Station Phone: (435) 797-2282
Collaborating Unit(s)	Utah State University Departments of Nutrition and Food Science, Biology, CES, Utah Department of Agriculture and Food
FTE	.7 FTE
Required Program Support	Hatch: \$0.00 Multistate: \$171,287 State: \$113,041

*Professional FTE shown unless indicated otherwise.

<p style="text-align: center;">Utah State University Extension and Agricultural Experiment Station Full State Plan of Work Goal 2 – October 1, 2004 - September 30, 2006</p>	
Program Title	Safe and Secure Food and Fiber System (Integrated Program with Extension)
Program Duration	Long Term: five or more years
Principle Program Goal	Improve methods of discerning food safety, then enhance food safety consistent with shortcomings identified above.
CSREES Goal Area , Funding Source	Goal 2
Unit Point of Contact	H. Paul Rasmussen, Director Utah Agricultural Experiment Station Phone: (435) 797-2282
Collaborating Unit(s)	Utah State University Departments of Nutrition and Food Science, Biology, CES, Utah Department of Agriculture and Food, USDA, CSREES
FTE*	CES: 3.49 UAES: Hatch: .56 Multistate: .16 State: .02
Required Program Support	CES: 523,500 Hatch: \$39,124 Multistate: \$27,770 State: \$526,253

*Professional FTE shown unless indicated otherwise.

Program Title:

A Safe and Secure Food and Fiber System (**Integrated Program**)

Statement of Issue(s):

Food producers, food service establishments, and consumers all play a role in the safety of food. Research and outreach into the causes and results of unsafe food handling (including preparation). This issue has been identified in stake-holder listening session. The purpose of this program is to continue developing means to enhance the efficiency and security of America's food system and to develop strategies for ensuring food safety.

Performance Goal(s):

Improve methodologies of discerning food safety problems. Enhance food safety by analyzing available food processing and handling procedures.

Key Program Components:

Research will focus on food handling systems, including food processing and food handling.

Internal and External Linkages:

Internal - Scientists from the departments of Nutrition and Food Science and Biology, in cooperation with Extension specialists and county family and consumer science agents will contribute in meeting these goals. Cooperative Extension will play a key role in assisting in the identification of needs and potential partners, as well as be instrumental in the outreach effort.

External - Public and private partnerships will be developed and maintained to better meet these goals. Outside private entities will include food processing groups, restaurants and other food establishments, and households.

Target Audience(s):

Primarily households, plus businesses involved in the production, manufacturing and transportation of foods.

Evaluation Framework:

Factors influencing food safety have been identified, though more research is needed in developing a broad listing of risk factors. Programs and educational processes can address food safety issues will be identified.

Output Indicator(s):

Development of a set of food processing, manufacturing, and handling safety concerns. A plan to address these concerns.

Outcome Indicator(s):

Enhanced food safety within Utah.

Program Duration:

The background safety identification process is expected to be completed in two years. The work in educating the population regarding food safety issues is expected to be longer term, i.e., 5-10 years.

Allocated Resources:

Extension FTE's: 3.49
\$523,500

Experiment Station FTE's: Hatch - .55; Multistate - .16; State - .02
Hatch - \$39,124; Multistate - \$27,770; State - \$526,263

Education and Outreach Programs:

Current activities include research identifying the nature and extent of food pathogens that enter the food process either in production, manufacturing, distribution, or home preparation. Ongoing extension-related activities include tours, youth training programs in food handling, training videos, food service manager courses, independent training modules, seminars and other activities to meet food safety issues.

Points of Contact:

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Goal 3 Addendum

Through research and education in nutrition and development of more nutritious foods, enable people to make health-promoting choices.

Extended Programs from FY 2000-FY 2004 Plan of Work:

Extension Extended Programs

- Nutrition and Health
- Expanded Food and Nutrition Education Program

Experiment Station Programs

- Agricultural Product Enhancement

New Programs for FY2005 – FY2006 Plan of Work:

Experiment Station Programs

- Enhancing Human Health and Nutrition (**Integrated Program**)

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 3 – October 1, 1999-September 30, 2006**

Program Title	Nutrition and Health (Integrated with Experiment Station)	Expanded Food and Nutrition Education Program (EFNEP)	Agricultural Product Enhancement
Program Duration	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period	Long Term: Five to Seven Year Planning Period
Principle Program Goal	Optimum 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. This program will improve the quality of diet through improved eating behaviors and increased nutritional knowledge.	EFNEP families will develop and acquire the knowledge, skills, attitudes and changed behaviors necessary for nutritionally sound diets and will contribute to their personal development. This program is specifically targeted to low income families with children.	Agriculture must continue to develop and enhance food and fiber products. Not only will a continued investment provide amore safe food and fiber system, it will also improve access to a more affordable food and fiber supply.
CSREES Goal Area, Funding Source	Goal 3: Smith-Level 3 b (1) and c	Goal 3: Smith-Lever 3(d)	Goal 3: Hatch, State
Unit Point of Contact	Barbara Rowe, Utah State University Family and Consumer Science Program Leader Phone (435) 797-1535	Barbara Rowe, Utah State University Family and Consumer Science Program Leader Phone (435) 797-1535	H. Paul Rasmussen, Director, Agricultural Experiment Station, Phone: (435) 797-2207
Collaborating Unit(s)	State agencies and multi- county areas within the state of Utah. Native American Tribes.	State agencies and multi- county areas within the state of Utah. Native American Tribes.	Extension and state agencies including the Utah Department of Human Services.
FTE*	CES: 3.9 FTE	CES: 2.5 Prof FTE, 15 Para Prof FTE	UAES: Hatch: 5.94 Multistate: 1.36 State: 5.01
Required Program Support (all sources)	CES: \$585,000 annually	CES: \$1,125,000 annually	UAES: Hatch: \$569,951 Multistate: \$273,388 State: \$1,229,425

*Professional FTE shown unless indicated otherwise.

Utah State University Extension and Agricultural Experiment Station Full State Plan of Work Goal 3 – October 1, 2004 - September 30, 2006	
Program Title	Enhancing Human Health and Nutrition
Program Duration	Long Term: Five to Seven Year Planning Period
Principle Program Goal	To provide sufficient research base in human health and nutrition to provide the basis for applied educational and outreach programs.
CSREES Goal Area, Funding Source	Goal Area 3
Unit Point of Contact	Dr. H. Paul Rasmussen, Director, Utah Agricultural Experiment Station, Phone: (435) 797-2207
Collaborating Unit(s)	Utah CES, Utah Department of Human Services, and various USDA programs
FTE*	CES: 3.9 (repetitive) State - .01
Required Program Support	CES: \$585,000 (repetitive) Hatch: \$0.00 Multistate: \$0.00 State: \$155,372

*Professional FTE shown unless indicated otherwise.

Program Title:

Enhancing Human Health and Nutrition

Program Duration:

Long term, 5-7 years

Statement of Issue(s):

The human population faces some difficult health issues including obesity and diabetes, as well as many other diseases and illnesses. Obesity is on the verge of becoming the nation's #1 killer. There are many other health issues that are related to obesity including diabetes, heart problems, kidney and liver failure, hardening of the arteries, loss in work hours, etc. It is critical that human health and nutrition issues be addressed in a systematic and logical way.

Performance Goal(s):

Improvement in child and adult health.

Key Program Component(s):

The primary efforts will be to research the causes of and cures to many of today's health and nutrition problems. This includes work on the nutrition side to determine what foods and food products might improve human health, as well as what foods are detrimental to human health. It will also include an effort on the health side to determine causes or contributing factors to various common ailments facing America's populations.

Internal/External Linkage(s):

Internal – Units involved include Utah’s Extension Service, plus the Nutrition and Food Sciences Department, the Center for Integrated Biosystems, and the Department of Biology.

External – This would include various state agencies (e.g., Department of Agriculture and Food and Department of Human Services) and federal agencies (USDA, Health and Human Services, the National Institutes of Health, and the EPA).

Target Audience(s):

The general public.

Evaluation Framework:

The number of determinations as to health and nutrition issues and the number of solutions (partial or whole) to the health and nutrition issues previously identified.

Output Indicator(s):

Indicators are based on improving a population’s health.

Outcome Indicator(s):

Reductions in health care costs and/or improvements in health and nutrition measurements.

Program Duration:

Most programs will require a long term effort, 5-10 years.

Allocated Resources:

Extension FTE’s: 3.9
\$585,000

Experiment Station FTE’s: .01
State - \$155,372

Education and Outreach Programs:

The determination of human health and nutrition problems will be used by Extension specialists and family and consumer science agents as a basis for the development and distribution of educational programs. It is difficult to say what form those will come in at present, but information will be transferred to the general public and through extension health and nutrition specialists and county family and consumer science education agents.

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Goal 4 Addendum

Enhance 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.

Extended Programs from FY 2000-FY 2004:

Extension Extended Programs from FY2000 – FY2004 Plan of Work

- Fisheries and Wildlife
- Statewide Water Quality Education and Technical Support
- Dairy Manure Lagoon Management
- Rural and Community Forestry Extension
- Non-Point Source Pollution: Improving Water Quality Through Irrigation Management
- Sustainable Livestock Production: Animal Feeding Operations and Environmental Quality
- Environmental Education – Agriculture, Grazing, Wildlife, and Water Quality
- Grazing and Weed Control on Public Lands
- Water Conservation – Culinary Water Use and Landscape Water Management
- Beneficial Use of Municipal Sewage Sludge in Utah
- Range Resources
- Noxious Weed Control

Experiment Station Extended Programs from FY2000 – FY2004 Plan of Work

- Pasture Development, Reclamation, and Quality
- Human, Wildlife, and Domestic Livestock Interactions and Compatibility

New Programs from FY2005 – FY2006:

New Extension and Agricultural Experiment Station Programs:

- Environment and Climate Change: Enhance Extension's Ability to Deliver Environmental Quality Programs for Agriculture (CES)
- Extension Educational Programs on Water Resource Issues: Storm Water Runoff (CES)
- Improving Forest Management (UAES)
- Enhancing Natural Resource Management (UAES)
- Increasing Water Efficiency and Conservation (**Integrated**)
- Extension Educational Program on Water Resource Issues: Quality Culinary Water and Groundwater Protection (CES)

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 4 – October 1, 1999-September 30, 2006**

Program Title	Fisheries and Wildlife	Statewide Water Quality Educational and Technical Support	Dairy Manure Lagoon Management
Program Duration	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period Farm	Long Term: Five Year Planning Period
Principle Program Goal	This program seeks to develop through a system of sustainable development partnerships programs which will remediate, assess and evaluate wildlife damage, wetland and endangerment conservation and grazing management on public lands. Through linkages with federal, state and private agencies, stakeholders will become involved in facilitation decision making for public conservation policy.	The general public and political leaders of Utah consistently identify water resources and water quality as a high program priority. The goal of this program is to develop and deliver water quality education and outreach programs to diverse populations in Utah. Such programs as K-12 watershed education, volunteer stream monitoring programs and Farm *A* Syst program will be included.	Dairy producers must be educated about proper management of waste lagoons to prevent nutrients from entering surface and ground water. This program will train dairy producers in the best management practices for waste lagoon management through a combination of workshops, seminars, newsletters and on-farm visits.
CSREES Goal Area, Funding Source	Goal 4: State Base	Goal 4: Smith-Lever 3(d)	Goal 4: State Base
Unit Point of Contact	Dr. Terry Messmer Utah State University, Extension Wildlife Specialist, College of Natural Resources, Phone (435) 797-3975	Dr. Nancy Mesner Utah State University Aquatic, Watershed, and Earth Resources College of Natural Resources Phone (435) 797-2465	Dr. Ron Boman, Utah State University Animal, Dairy and Vet Sciences Department Phone (435) 797-2163
Collaborating Unit(s)	CES units in Nevada, Colorado, New Mexico, Arizona, Idaho and Wyoming	Brigham Young University and University of Utah along with numerous federal and state agencies.	CES Units in Wyoming and Montana. Collaboration also with DHIA.
FTE	1.8 FTE Specialist and Agent Time	2.5 FTE	.2 FTE
Required Program Support (all sources)	\$270,000 annually	\$375,000 annually	\$30,000 annually

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 4 – October 1, 1999-September 30, 2006**

Program Title	Rural and Community Forestry Extension	Non-point Source Pollution: Improving Water Quality Through Irrigation Management	Sustainable Livestock Production: Animal Feeding Operations and Environmental Quality
Program Duration	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period
Principle Program Goal	This program will improve private forest management, enhance sustainable processing and use of forest products, improve the health and quality of urban/community forests, reduce fire hazards, increase the health and functionality of windbreaks and increase adult and youth awareness of forestry issues.	Reducing salt load in the Colorado River is a national and regional goal. This program will control salt loading in the Colorado River by improving irrigation water management among farmers in eastern and east-central Utah. Tri-county collaborative project.	Five counties in Utah and several collaborative neighboring state counties will assist animal feeding operations in responding to the new USEPA regulations regarding manure management to protect environmental quality. Confined livestock production enterprises can negatively impact natural resources and environmental quality, through a series of training programs regulatory standards will be delineated with livestock producers.
CSREES Goal Area, Funding Source	Goal 4: Smith-Lever 3 b (1) and c	Goal 4: Smith-Lever 3(d)	Goal 4: Smith-Lever 3 b (1) and c
Unit Point of Contact	Dr. Mike Kuhns, Utah State University, Extension Forestry Specialist, College of Natural Resources Phone (435) 797-4056	Dennis Worwood, Utah State University, Emery County Agent Phone (435) 381-2381 Boyd Kitchen, Utah State University Uintah County Agent, Phone (435) 781-5452 Marlon Winder, Utah State University Carbon County Agent, Phone (435) 636-3233	Utah State University County Agents Dean Miner, Gary Anderson, Scott Williams, Mark Nelson, and Rich Koenig, Utah State University Extension, Soil Specialist, Phone (435) 797-2278
Collaborating Unit(s)	Numerous federal and state agencies	Irrigation companies in the counties, Farm Service Agency and other state agencies	CES Units in Colorado, New Mexico, and Idaho and Utah Department of Environmental Quality, Division on Water Quality
FTE	3.0 FTE	.30 FTE	2.0 FTE
Required Program Support (all sources)	\$450,000 annually	\$45,000 annually	\$230,000 annually

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 4 – October 1, 1999-September 30, 2006**

Program Title	Environmental Education: Agriculture, Grazing, Wildlife and Water Quality	Grazing and Weed Control on Public Lands	Water Conservation: Culinary Water Use and Landscape Water Management (Partially Integrated with UAES. See reference later under new program.)
Program Duration	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period
Principle Program Goal	As Utah becomes more urban, social and political perspectives shift away from agriculture toward an urban-oriented land use. This program is to provide environmental education to various urban and suburban audiences in order to reduce urban/agricultural conflicts, enhance the public's perception of agriculture and improve agricultural urban land stewardship.	Livestock grazing has been a mainstay of agriculture in many Utah counties. Grazing monitoring and weed control on public lands are two issues of importance to grazers and agency personnel responsible for public land management. This program will train ranchers in how to monitor range conditions, and ranchers and agency personnel in how to control weeds on public lands.	Approximately one-half of the culinary water consumed in Utah is used for landscape irrigation. Many landscapes are watered inefficiently resulting in the waste of a valuable resource. This program will train water users to use culinary water more wisely by developing and implementing landscape irrigation system evaluation protocols and programs for urban water users.
CSREES Goal Area, Funding Source	Goal 4: State Base	Goal 4: State Base	Goal 4: State Base
Unit Point of Contact	Chad Reid, Utah State University Iron County Agent Phone (435) 586-8132	Jim Keyes, Utah State University San Juan County Agent, Phone (435) 587-3239 and Jack Soper, Utah State University Kane County Agent, Phone (435) 676-1117	Earl Jackson, Utah State University, Salt Lake County Agent Phone (801) 468-3184
Collaborating Unit(s)	Utah Counties, Iron, Washington, Kane, Garfield, Beaver, Wayne and Piute	Utah counties, San Juan, Garfield, Kane. BLM and US Forest Service with various other county weed boards throughout the state.	Utah Counties Salt Lake and Utah. Utah Water Conservancy Districts.
FTE	CES: .20 FTE	CES: .45 FTE	CES: .50 FTE
Required Program Support (all sources)	\$30,000 annually	\$67,500 annually	\$25,000 annually

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 4 – October 1, 1999-September 30, 2006**

Program Title	Beneficial Use of Municipal Sewage Sludge (Biosolids) in Utah	Range Resources	Noxious Weed Control
Program Duration	Intermediate Program Planning Period 1999-2001	Long Term: Five Year Planning Period	Long Term: Five Year Planning
Principle Program Goal	Municipal sewage sludge (biosolids) can be valuable resources if used properly as an organic matter and nutrient source in agriculture and horticulture situations. This program will increase public awareness of biosolids use, and encourage beneficial use as an alternative to landfill disposal of materials in Utah.	Pressure on rangeland owners and users in forcing efficiency and sustainable pasture, rangeland and watershed management required that Extension take an active role in leadership and education to increase environmental and economic sustainability of rangeland and pasture use.	Noxious weeds reduce agriculture productivity and threaten natural ecosystems in the West. This program will help private and public land managers stop the spread and reduce the existing acreage of noxious weeds in Utah.
CSREES Goal Area, Funding Source	Goal 4: State Base	Goal 4: Smith-Lever 3 b (1) and c	Goal 4: Smith-Lever 3 b (1) and c
Unit Point of Contact	Rich Koenig, Utah State University, Extension Soil Specialist Phone (435) 797-2278	Roger E. Banner, Utah State University, Extension Rangeland Specialist College of Natural Resources, Phone (435) 797-2472	Steve Dewey, Utah State University Plants, Soils and Biometeorology Phone (435) 797-2256
Collaborating Unit(s)	USDA-NRCS, Utah Dept of Agriculture, municipal waste treatment plant operators and Utah Dept of Environmental Quality	CES units in Arizona, Nevada, Wyoming and Montana	Utah agencies i.e., transportation, wildlife, BLM, Park Service, SCS, Forest Service
FTE	1 FTE	1 FTE	1.75 FTE
Required Program Support (all sources)	\$139,000 annually	\$135,000 annually	\$262,500 annually

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 4 – October 1999 - September 30, 2006**

Program Title	Pasture Development, Reclamation, and Quality	Human, Wildlife, and Domestic Livestock Interactions and Compatibility
Program Duration	Long Term: Seven or more years	Long Term: Seven or more years
Principle Program Goal	Improve conditions for existing irrigated pastures; Expand use of intensively managed irrigated pastures where economically justifiable.	Identify the ability and extent to which humans, wildlife, and domestic livestock can successfully coexist.
CSREES Goal Area, Funding Source	Goal 4- State; Other Federal	Goal 4 - Hatch, Multistate, State
Unit Point of Contact	H. Paul Rasmussen Director, AES Phone (435) 797-2282	H. Paul Rasmussen, Director, AES Phone (435) 797-2282
Collaborating Unit(s)	CES; All departments within the College of Agriculture, plus others in Business, Engineering and Natural Resources; plus ARS and CSREES, USDA	CES; Departments within the colleges of Agriculture, Natural Resources, Businesses, and Sociology; Utah Department of Natural Resources; ARS and CSREES, USDA
FTE	UAES: .16 scientist 2.4 - professional .55 - technical	UAES: Hatch - 1.68 Multistate - 1.40 State - 6.15
Required Program Support (all sources)	UAES: Hatch - \$0.00 Multistate - \$0.00 State - \$220,982	UAES: Hatch - \$111,566 Multistate - \$188,263 State - \$2,228,191

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 4 – October 2004 - September 30, 2006**

Program Title	Extension Educational Programs on Water Resources Issues: Quality Culinary water and Groundwater Protection	Environment and Climate Change: Enhance Extension's ability to deliver environmental quality programs for agriculture	Extension Educational Programs on Water Resource Issues: Storm Water Runoff
Program Duration	Long Term: two or more years	Long Term: two or more years.	Long Term: two or more years.
Principle Program Goal	Develop and deliver educational programs concerning the quality of drinking water; Assist families and communities to provide a safe and adequate supply of drinking water at both the home and community levels.	Utah State University Extension will form an agriculture environment issue team and subsequently develop an AEMS program to meet the current and future environmental needs of agriculture.	Develop a statewide team of Extension and campus academic faculty capable of creating and delivering imaginative and unique educational programs that assist communities to cope with storm water runoff issues.
CSREES Goal Area, Funding Source	Goal Area 4: State Base	Goal Area 4: State Base	Goal Area 4: State Base
Unit Point of Contact	Dr. Nancy Mesner Utah State University Aquatic, Watershed, and Earth Resources Phone: (435) 797-2465	Dr. Clell Bagley, Extension Program Leader, ANR Phone (435) 797-1882	Dr. Nancy Mesner Utah State University Aquatic, Watershed, and Earth Resources Phone: (435) 797-2465
Collaborating Unit(s)	University-wide team; EPA; USGS; USBR, DOI, USDA, Utah Department of Public Health, Utah's Department of Environmental Quality (DEQ) and Division of Water Resources (DWR)	Utah State University's Colleges of Agriculture, Natural Resources, and Engineering; Farm Bureau, Farmers Union, Utah Department of Agriculture and Food, agricultural producers, and the overall agricultural community	University-wide team; EPA; USGS; USBR, DOI, USDA, Utah Department of Public Health, Utah's DWR
FTE	CES: _____	CES: 2.8	CES: 1.0
Required Program Support (all sources)	CES: _____	CES: \$420,000	CES: \$150,000

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 4 – October 2004 - September 30, 2006**

Program Title	Improving Forest Management	Enhancing Natural Resource Management	Increasing Water Efficiency and Conservation (Integrated)
Program Duration	Long Term: Seven or more years	Long Term: Seven or more years	Long Term: Seven or more years
Principle Program Goal	Improvement of Forest Management including multiple use considerations, global warming, and forest-community interactions.	Natural resources are an integral part of Utah and the Western U.S. It is critical that issues related to the management of these natural resources be understood, with problems and potential solutions identified. Given the nature of the natural resource base in the West, it is highly likely that solutions to a problem in one area, i.e., public land grazing, might have immediate application to another area, i.e., private range management.	Much of the Western U.S. is semi-arid and issues related to water conservation and efficiency of use are of paramount importance in meeting current and future water needs that often compete depending on the use and user. The primary goal of this program is to identify areas related to water efficiency and conservation, then determine potential solutions for these difficulties.
CSREES Goal Area, Funding Source	UAES: Hatch, Multistate, State	UAES: Hatch, Multistate, State	CES: Smith-Lever 3(d) UAES: Hatch, Multistate, State
Unit Point of Contact	Dr. H. Paul Rasmussen Director, UAES Phone: (435) 797-2282	Dr. H. Paul Rasmussen Director, UAES Phone: (435) 797-2282	Dr. H. Paul Rasmussen Director, UAES Phone: (435) 797-2282 Dr. Nancy Mesner Utah State University Aquatic, Watershed, and Earth Resources Phone: (435) 797-2465
Collaborating Unit(s)	Utah State University Colleges of Agriculture, Natural Resources, Business, and Humanities, Arts, and Social Sciences (HASS); US Forest Service, USDA; Utah Department of Natural Resources.	Utah State University Colleges of Agriculture, Natural Resources, Business, and Humanities, Arts, and Social Sciences (HASS); US Forest Service, USDA; Utah Department of Natural Resources.	Utah State University Colleges of Agriculture, Natural Resources, Business, HASS, and Engineering; U.S. Bureau of Reclamation, DOI, and U.S. Forest Service, USDA; Utah Department of Natural Resources including the DWR and DEQ.
FTE	UAES: State - .5	UAES: Hatch - .4 Multistate - .13 State - .03	CES: .5 (duplicate) UAES: Multistate - .43 State - .03
Required Program Support (all sources)	UAES: State - \$76,644	UAES: Hatch - \$32,925 Multistate - \$22,834 State - \$1,122,732	CES: \$25,000 (duplicate) UAES: Multistate - \$51,829 State - \$446,957

*Professional FTE shown unless indicated otherwise.

Utah State University Extension and Agricultural Experiment Station Full State Plan of Work Goal 4 – October 2004 - September 30, 2006	
Program Title	Extension Educational programs on Water Resource Issues: Quality Culinary Water and Groundwater
Program Duration	Long Term: Two or more years
Principle Program Goal	Development and delivery of programs concerning safe drinking water and groundwater protection.
CSREES Goal Area, Funding Source	Goal 4, Smith-Lever, State Base
Unit Point of Contact	Dr. Nancy Mesner USU Aquatic, Watershed, and Earth Resources Phone: (435) 797-2465
Collaborating Unit(s)	Utah State University Colleges of Agriculture, Natural Resources, Business, and Humanities, Arts, and Social Sciences (HASS); US EPA, USGS, Bureau of Reclamation, Utah's DEQ, DWR, and Department of Public Health
FTE	UAES: State - 1.0
Required Program Support (all sources)	UAES: State - \$150,000

*Professional FTE shown unless indicated otherwise.

Program Title:

Environment and Climate Change: Enhance Extension's ability to deliver environmental quality programs for agriculture.

Statement of Issue(s):

In the 30 years since passage of the Clean Water Act, significant progress has been made in improving and protecting our nation's waters. Point source industrial discharges have been reduced and treated, and many rivers and lakes have been restored to thriving fisheries and recreational resources. Much work still needs to be done. Approximately 40% of U.S. waters still do not meet water quality standards. Much of today's pollutants come from non-point sources such as urban runoff and agricultural activities. Animal feeding operations (AFOs) have been identified by the Environmental Protection Agency and the Natural Resource Conservation Service as a source of nutrients, sediments, and disease-causing bacteria entering waters. In Utah, approximately 25% of streams and rivers are considered impaired or at risk from excess sediment and nutrient loads. Animal agriculture has been identified as a significant source of this impairment. In response to a national strategy issued by EPA and USDA to reduce water quality pollution from AFOs, Utah has developed a state strategy. The Utah State AFO/CAFO strategy has brought many partners together to develop a program which encourages better nutrient management on farming operations, voluntary improvements in pollution control, and which provides financial, technical, and educational assistance to producers to help them meet these new goals. Extension is a full partner in Utah's AFO/CAFO Strategy, participating fully in developing the strategy and taking the lead in producing two widely distributed brochures explaining the policy and nutrient management planning requirements. Extension has also organized and conducted over 15 workshops and 12 satellite training sessions on different aspects of the AFO strategy.

Air quality and biological pathogens are widely regarded as the next major issues to be faced by animal agriculture. In order to continue to meet environmental requirements faced by livestock producers, this initiative describes the development and implementation of a systematic approach to environmental management, an agriculture environmental management system (AEMS). Environmental management systems (EMS) have their foundation in industry and the ANSI/ISO 14001 standards. An EMS is a systematic, highly structured framework in which to evaluate all aspects of an operation and identify those having either a positive or negative impact on the environment. Once the system framework and interrelationships have been evaluated, processes can then be identified and targeted for modification to reach environmental goals or regulations. The EMS process is cyclical and allows an operation to continuously improve environmental performance and address new environmental issues as necessary. Adapting this industry approach to livestock production systems should result in a more efficient, flexible and proactive response to current (water quality) and future (air quality and pathogens) environmental issues.

Performance Goal(s):

Utah State University Extension will form an agriculture environment issue team and subsequently develop an AEMS program to meet the current and future environmental needs of agriculture. The AEMS program may also provide the framework for the development of other issue teams taking a systematic approach to new agricultural issues.

Key Program Components:

Formation of a qualified AEMS issue team. Continued development of public outreach workshops and satellite programs on AFO/CAFO strategies, air and water environmental management programs that affect agriculture. Production of public fact sheets and brochures to provide environmental information to agriculture. Work with individuals to resolve specific problems and direct them to resources available.

Internal and External Linkages:

Internal – Scientists from numerous departments in the Colleges of Natural Resources, Agriculture, Business, Engineering, and Humanities, Arts, and Social Sciences (HASS).

External – The agriculture community in Utah including the Farm Bureau, Farmers Union, Utah Department of Agriculture and Food and other Utah based USDA partners will collaborate in developing outreach programs to educate and inform agricultural producers and the agricultural community on principles and practices to protect and remediate potential damage to the environment.

Target Audience(s):

Agricultural producers, State, Federal and local agency personnel servicing producers, Landowners, and Agricultural supply vendors.

Evaluation Framework:

Evaluate the effectiveness of the agriculture environmental management systems (AEMS) issue team of specialists and agents with the appropriate areas of expertise as evidenced by logic modeling engaged in by the team which support the identified outputs and planned outcomes of the team projects.

Output Indicator(s):

The formation of an AEMS interdisciplinary issue team to address the needs of the Utah agricultural community. Development of an electronic web site to serve the needs of agricultural producers and service agencies. The development of a decision support tree and AEMS curriculum will be put into place. Specific case studies will be identified and examples posted to the web electronic site to help producers remediate environmental damage.

Outcome indicator(s):

Review of potential fact sheets and publications to support the AEMS efforts.
Development of identified brochures and fact sheets to support the needs identified.
Numbers of producers worked with to resolve difficult problems.

Program Duration:

Long Term - two or more years.

Allocated Resources:

Extension FTE's: 2.80

2.80 x \$150,000 = \$420,000

Education and Outreach Programs:

Current ongoing activities include tours, field days, demonstration and seminars and workshops delivered face to face and via satellite to agricultural producers desiring to remediate practices contributing to the degradation of the environment.

Point of Contact:

Dr. Clell V. Bagley

Extension Program Leaders Agriculture, Natural Resources

5600 Old Main Hill

Logan, Utah 84322-5600

Phone (435) 797-1882

E-mail: clellb@ext.usu.edu

Program Title:

Extension Educational Programs on Water Resource Issues: Storm Water Runoff

Statement of Issue(s):

As communities grow, land that once absorbed moisture from snow melt and rainfall, now is covered with impervious materials that increase runoff. By necessity, this water, collected in storm drains, must have an outlet. Most often, this water moves to irrigation canals used to transport water to agricultural land where it is used during the plant-growing season or is collected and allowed to evaporate. Occasionally, the runoff is sufficient to force opening gates or a break in the levee occurs causing flooding. Many storm water systems open to streams or lakes. Storm drains are also points of contamination. Petroleum products from automobile related activities are a large source of pollution. Other household products, such as paints, thinners, solvents, and even prescription drugs, find their way into storm drains. The public needs to understand how this impacts a community's clean water supply. As growth occurs, the EPA is becoming more stringent in its regulation of storm water runoff. Extension has a very important role to play as a partner, working with state and federal agencies, to educate the public. As they grow, all communities capture natural streams and lakes. They also create lakes to control flooding and supply water. These water features often are used as the foci to create parks and other recreational areas. These areas are critical to the maintenance of an urban wildlife population. As mentioned above, these areas often are used as outlets or containments for storm water runoff.

Performance Goal(s):

Develop a statewide team of Extension and campus academic faculty capable of creating and delivering imaginative and unique educational programs that assist communities to cope with storm water runoff issues.

Key Program Components:

Extension, with its landscape architecture, recreation, urban forestry, wildlife, water quality, soils management, waste management specialists, and the Utah Botanical Center facility is uniquely equipped to develop assistance and education programs for communities to help design, construct, and manage such areas. The Utah Botanical Center will become a demonstration site for state-of-the-art storm water management. All roads and parking areas at the Center will be constructed to address storm water issues through the use of porous materials and adjacent vegetated areas. The Center has received funding from the Utah Association of Conservation Districts and the Environmental Protection Agency to develop this facility.

Internal and External Linkages:

This program will partner with the Utah Botanical Center, Environmental Protection Agency, and other federal and state agencies.

Target Audience(s):

Local government.

Evaluation Framework:

Factors influencing storm water runoff will be identified and alternative means of dealing with such occurrences will be developed.

Output Indicator(s):

Number of communities who use the Utah State University Storm Water Runoff resource team to address storm water runoff in their communities.

Outcome Indicator(s):

Number of communities implementing appropriate storm water management.

Program Duration: Long term - two or more years.

Allocated Resources:

Extension FTE's: 1.0
\$150,000

Education and Outreach Programs:

Current ongoing activities include tours, field days, demonstration and seminars and workshops delivered face to face and via satellite to communities leaders and residents desiring to ameliorate storm runoff events.

Point of Contact:

Dr. Nancy Mesner
USU Aquatic, Watershed, and Earth Resources
College of Natural Resources
5210 Old Main Hill
Logan Utah 84322-5210
Phone: (435)797-2465
E-Mail: nancym@ext.usu.edu

Program Title:

Improving Forest Management

Statement of Issue(s):

Forested lands throughout the Western U.S. are subject to a variety of dangers including fire and diseases introduced by insects or other organisms. Not every state has an equal proportion of their land covered by forests, but work done in one area is quickly transferable to another in meeting the problems encountered system-wide. There has been an ongoing debate with respect to the management of forested lands and fire control. In addition, vast areas within the West have been damaged by bark beetles. It is critical for the health of the communities that surround these forested areas that these, and similar, problems be addressed.

Performance Goal(s):

Improve health of forested lands and the communities that surround those lands.

Key Program Components:

Research will focus on the forest system, including the communities surrounding forested lands. The research will range from forest diseases to forest-reliant communities.

Internal and External Linkages:

Internal: Research scientists from five of Utah State University's colleges will assist in the accomplishment of this goal: Natural Resources, Businesses, Agriculture, Science, and Humanities, Arts, and Social Sciences (HASS). Information generated through the research process will be exchanged with CES specialists and with county agents. Collaboration with the Western Rural Development Center will also be accomplished.

External: External linkages include the Utah Departments of Agriculture, Natural Resources, and Community Economic Development. In addition, university scientists will collaborate with scientists within the Ogden and Denver offices of the U.S. Forest Service.

Target Audience(s):

Primarily citizens living in communities in or near forested lands, though the research is also expected to extend to more heavily populated areas as forest health improves.

Evaluation Framework:

Factors influencing forest health will be identified relative to their effect on physical output from the forests, as well as amenities resulting from the standing forest.

Output Indicator(s):

Identification of factors influencing forest and communities surrounding forested areas will take place. In addition, methods of controlling or ameliorating these negative influences will be developed.

Outcome Indicator(s):

Identifying improvements in physical forest health and surround community vitality.

Program Duration:

Long Term - seven or more years.

Allocated Resources:

Experiment Station FTE's: State - .5

State - \$76,644

Education and Outreach Program(s):

There will be close collaboration between the experiment station scientists and the extension specialists on and off campus. Many of the participating scientists and specialists, in fact, have dual assignments in both extension and the experiment station. Information relative to factors influencing forest and rural community health and vitality will be developed for distribution through extension channels, including written materials and public training sessions.

Point of Contact:

Dr. H. Paul Ramussen, Director
Utah Agricultural Experiment Station
4810 Old Main Hill
Logan, UT 84322-4810
Phone: 435-797-2207
E-mail: paul@agx.usu.edu

Program Title:

Enhancing Natural Resource Management

Statement of Issue(s): The West's highest valued resource may be the natural environments found therein. There is an enormous variety of land ownership patterns in the West, almost totally foreign to those living elsewhere in the U.S. Private land typically comprises a small part of the total land base. State lands are often dispersed throughout the landscape in a checkerboard fashion. Federal lands range from those managed by the U.S. Forest Service and Bureau of Reclamation, to those managed by the

Park Service. With such large tracts of public land and corresponding natural resource base, it is imperative that means of managing such a diverse landscape be developed to assist rural communities while maintaining the integrity of the existing natural resource base.

Performance Goal(s):

To identify methods of resource management that can apply to public and/or private land ownership patterns in the west such that the vitality of rural communities can be maintained while natural landscapes are provided necessary protection.

Key Program Components:

The research related to this program will involve (a) identifying the issues related to major historical and current resource management conflicts, (b) developing alternative means of dealing with such conflicts, and (c) development of materials (for journal publications as well as more popular outlets) that can be used to assist local and regional communities in dealing with difficult natural resource issues.

Internal and External Linkages:

Internal: Several colleges within Utah State University will participate in natural resource management research including Natural Resources, Agriculture, Business, and Humanities, Arts, and Social Sciences (HASS), and Science. The UAES will cooperate with the CES as both attempt to provide solutions to critical and, often, contentious natural resource issues. Collaboration with the Western Region Development Center will also be obtained.

External: External linkages include several state-level departments in Utah (i.e., Agriculture and Food, Natural Resources, Community Economic Development, Health, etc.), plus numerous federal agencies including the U.S. Forest Service, the Bureau of Land Management, Department of Parks including national parks and national monuments, and Bureau of Indian Affairs.

Target Audience(s):

The primary target for this research (and outreach) effort are rural communities throughout the West.

Evaluation Framework:

Improvement in rural community health and vitality, along with appropriate protection of natural resource base, will be the determining criteria in evaluating the success of this program.

Output Indicator(s):

Problems related to areas with extensive natural resources will be identified. High priority problems or conflicts will be determined. Alternative methods of solving such conflicts or problems will be developed.

Outcome Indicator(s):

An improvement in the vitality of rural communities in areas with high profile natural resources should be seen if this program is successful. The level of protection provided to high profile natural resources will also be used as a measure of success.

Program Duration:

Long Term - seven or more years. These problems have been long in the making, it is unreasonable to expect that there will be significant progress toward solutions in the immediate future.

Allocated Resources:

Experiment Station FTE's: Hatch - .4; Multistate - .13; State - .03
Hatch - \$32,925; Multistate - \$22,834; State - \$1,122,732

Education and Outreach Program(s):

This effort will not be successful without an outreach component. As noted above, many of the research scientists involved in this area of work also have an extension appointment. There are also numerous relationships that have already been built over time that will facilitate the outreach effort, both within local and regional communities.

Point of Contact:

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Program Title:

Increasing Water Efficiency and Conservation

Statement of Issue(s):

Much of the West is semiarid and droughts tend to exacerbate the difficulties associated with semiarid areas. Even in periods of heavier than normal precipitation, there is insufficient water to meet all of the competing needs that correspond to life and livelihoods today. When periods of drought are experienced, these competing demands are even more contentious. Means of allowing water to go to its most efficient or beneficial use need to be developed and this involves an examination of both the legal and social basis for existing water allocations, but also the physical relationships that might be used to ameliorate some of the problems associated with competing uses in a highly competitive society.

Performance Goal(s):

More efficient use of scarce water resources.

Key Program Components:

Research will focus on water values in alternative uses, as well as the physical, social, and legal means to allow water to move to the highest valued uses.

Internal and External Linkages:

Internal: Work on campus will involve several colleges, including Business, HASS, Engineering, Natural Resources, and Agriculture. There will also have to be a close and ongoing relationship between the Agricultural Experiment Station and Extension to allow this program area to succeed.

Target Audience(s):

Citizens, businesses, entrepreneurs, natural environments, and government.

Evaluation Framework:

Physical, social, and legal barriers to water in moving to the highest valued (not necessarily in a strict economic sense) will be examined with alternative solutions identified for the most serious problem areas.

Output Indicator(s):

Identification of barriers that keep water from moving to its highest valued use. Alternative strategies for reducing or eliminating such barriers. Development of means to educate private citizens, businesses, and governments regarding the nature of the issues and potential solutions.

Outcome Indicator(s):

Measuring the improvement in water distribution and/or allocation over time using physical, economic, and social instruments.

Program Duration:

Long Term - seven or more years.

Allocated Resources:

CES FTE: .5

\$75,000

Experiment Station FTE's: Multistate - .43; State - .03

Multistate - \$51,829; State - \$446,957

Education and Outreach Program(s):

This effort will not be successful without an outreach component. Many of the research scientists involved in this area of work also have an extension appointment. There are also numerous relationships that have been built over time that will facilitate the outreach effort, both within local and regional communities.

Points of Contact:

Dr. H. Paul Rasmussen, Director
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Dr. Nancy Mesner
USU Aquatic, Watershed, and Earth
Resources
5210 Old Main Hill
Logan, UT 84322-5210
Phone: (435) 797-2465
E-mail: nancym@ext.usu.edu

Program Title:

Extension Educational Programs on Water Resource Issues: Quality Culinary Water and Groundwater Protection

Statement of Issue(s):

At the most basic level, a clean safe supply of drinking water in the home, supplied by the local government, is essential. All human health begins with the quality of the water supply. Families must have confidence that their in-home water supply is adequate and safe, and look to their community, county, and state governments to provide it. Those persons, who are elected or employed to provide high quality drinking water, are faced with an ever-increasing array of regulations and laws governing the management of drinking water systems. This is an especially critical issue on the Native American reservations in the state. Water treatment in the home, at the wellhead, and in the community facility is an important component of the drinking water issue. This is particularly true today as the demand increases. The Utah State University Water Laboratory has worked on water treatment issues for many years and has developed guidelines to assist in this subject at all levels. In addition, the use of “gray water” becomes important for home and municipal irrigation to help offset demand on culinary water, as well as provide a “secondary use.” Utah is only beginning to look at this. With the development of an approved capture system, homes could be retrofitted to use this source of water for ornamental irrigation. This would reduce the use of culinary water during summer months while reducing the amount of particulates added to the septic system. Extension specialists will work with the Water Lab, policy-making groups, and the public to develop educational programs concerning this important conservation technology. As human population densities increase, farmland is fragmented into “ranchette” type housing, and more and more wells are drilled to supply drinking water. Groundwater protection is becoming an ever-increasing problem. The heavy use of garden pesticides and fertilizers to maintain home landscaping is an important source of groundwater contamination. Concentrated animal feeding operations are not the only sources of surface water contamination, but can also contaminate groundwater sources. Utah’s active mining and processing industries are also contributors to groundwater contamination from heavy metals to solvents. Groundwater protection is an emerging issue for Utahans. Because Utah is a large state with a history of low population living in a highly dispersed manner, groundwater issues have not been of great concern. As the demography of the state changes with the population concentrated along the “Wasatch

Front,” this issue is becoming much more important, and the level of monitoring and mitigation has increased accordingly. Development and delivery of programs concerning safe drinking water and groundwater protection will require close cooperation among campus faculty, subject matter specialists, and county family and consumer science agents.

Performance Goal(s):

Develop and deliver educational programs concerning the quality of drinking water. Assist families and communities to provide a safe and adequate supply of drinking water at both the home and community levels.

Key Program Components:

The key program component is development of a university wide team capable of developing and delivering highly integrated programs concerning drinking water quality and quantity. This team will be made up of Extension and campus academic personnel involved with potable water supply issues.

Internal/External Linkages:

Internal – Extension will work with campus faculty, subject matter specialists, and county family and consumer science agents, and the Utah State University Water Laboratory.

External – Utah State University Extension has developed a good working relationship with the U.S. Environmental Protection Agency, the U.S. Geological Survey, the U.S. Bureau of Reclamation, the Utah Department of Environmental Quality, the Utah Department of Public Health, and the Division of Water Resources. All of these partners and more will have to be part of the education and information team to assist the public to make proper choices.

Target Audience(s):

Homeowners with septic systems and municipalities’ and counties’ leaders, and public works employees who manage or operate culinary water systems. Native Americans on Utah Native American Reservations.

Evaluation Framework:

Quantify the number of educational programs, homeowners, municipal and county leaders attending programs, and satisfaction levels with information provided. Appropriate specialists and agents identified to develop new materials with appropriate evaluation protocols.

Output Indicator(s):

An organized team made up of specialists, agents, and campus faculty that develops and delivers highly integrated programs concerning water quality and quantity. The number of families and communities who participate in quality of drinking water educational programs.

Outcome Indicator(s):

The number of families and municipalities that incorporate quality of drinking water programs to provide a safe and adequate supply of drinking water in their communities.

Program Duration:

Long Term - two or more years.

Allocated Resources:

Extension FTE's: 1.0

\$150,000

Point of Contact:

Dr. Nancy Mesner

USU Aquatic, Watershed, and Earth Resources,

College of Natural Resources

5210 Old Main Hill

Logan Utah 84322-5210

Phone: 435-797-2465

E-mail: nancym@ext.usu.edu

Goal 5 Addendum

Empower people and communities, through research-based information and education, to address the economic and social challenges facing our youth, families, and communities

Extended Programs from FY 2000-FY 2004 Plan of Work:

Extension Extended Programs from FY2000 – FY2004

- Family Financial Management
- Families and Youth at Risk
- Business Retention and Expansion
- Home-Based Business Development
- Community Organization and Leadership Development
- Community Planning and Design
- Economic Development
- Environmental Education
- Youth and 4-H

Agricultural Experiment Station Programs from FY2000 – FY2004

- Family Training, Development, Assistance, and Sociology is terminated.

New Extension and Agricultural Experiment Station Programs:

- Manufacturing Extension Service
- Improving Rural Vitality
- Extension Educational Programs on Water Resource Issues: On-Site Wastewater Treatment
- Helping Youth and Families at Risk (Experiment Station added to Extension's ongoing program)
- Assisting in Community Economic and Social Development
- Assessing the Impacts of Changes in Rural Communities

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 5 – October 1, 1999-September 30, 2006**

Program Title	Family Financial Management	Families and Youth at Risk (UAES integrated with this program as noted later.)	Business Retention and Expansion
Program Duration	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period
Principle Program Goal	Many Utah families are experiencing financial difficulty from being over-extended. Computer programs, seminars, classes, budget plans, etc. will be held to teach consumers how to deal with finances.	There has been a significant increase in all categories of criminal activity in Utah. Utah's Youth and Families with Promise program will address intervention with at-risk youth and their families.	Rural Utah is economically disadvantaged in competing for new business and industry. Extension will assist in retaining and expanding existing firms.
CSREES Goal Area, Funding Source	Goal 5: State Base	Goal 5: Smith-Lever 3 b (1) and c	Goal 5: Smith-Lever 3 b (1) and c
Unit Point of Contact	Barbara Rowe, Utah State University Family and Consumer Science Program Leader Phone (435) 797-1535	Barbara Rowe, Utah State University Family and Consumer Science Program Leader Phone (435) 797-1535	Steve Daniels, Utah State University Sociology, Social Work, Anthropology Phone (435) 797-1230
Collaborating Unit(s)	Local Senior Citizens Financial Institutions, Dept. workforce services, libraries, schools, and literacy groups.	CES Units include Juvenile Justice, Utah State University, 4-H Youth Development, Advisory Board.	CES Units in Colorado, New Mexico, Idaho, Oregon and Montana.
FTE	CES: 2.75 FTE	CES: 5 FTE	CES: 1 FTE
Required Program Support (all sources)	CES: \$412,500 annually	CES: \$582,000 annually	CES: \$150,000 annually

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 5 – October 1, 1999-September 30, 2006**

Program Title	Home Based Business Development	Community Organization and Leadership Development	Community Planning and Design
Program Duration	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period	Long Term: Five Year Planning Period
Principle Program Goal	The business development program focuses on education programs of improving and enhancing local business development of home occupations. Providing people with information and training on home-based business development.	Community organization leadership development is designed to increase participant's skills in organizing, operating, maintaining and evaluating local groups and organizations.	Rural communities lack planning personnel and skills to develop provision for planning and design. Training and workshops will be provided for communities.
CSREES Goal Area, Funding Source	Goal 5: State Base	Goal 5: State Base	Goal 5: State Base
Unit Point of Contact	Steve Daniels, Utah State University Sociology, Social Work, Anthropology Phone (435) 797-1230	Steve Daniels, Utah State University Sociology, Social Work, Anthropology Phone (435) 797-1230	Steve Daniels, Utah State University Sociology, Social Work, Anthropology Phone (435) 797-1230
Collaborating Unit(s)	CES Units in Chamber of Commerce Small Business Development Centers, and other Business Related Groups	CES Units include: Utah Association of Youth Councils, Governor's 21 st Century Community	CES Units in Oregon, Montana, Idaho, Wyoming, & associated communities
FTE	CES: 1 FTE	CES: 1 FTE	CES: 1 FTE
Required Program Support (all sources)	CES: \$150,000 annually	CES: \$150,000 annually	CES: \$150,000 annually

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 5 – October 1, 1999-September 30, 2006**

Program Title	Economic Development Planning	Environmental Education	Youth and 4-H
Program Duration	Long Term: - five year planning period	Intermediate Term: Two to five years	Long Term: Five or more years
Principle Program Goal	Rural West has limited employment opportunities, changing employment base to service industries and lower incomes. Economic information and technical assistance for strategic planning and goal setting will be available to three communities per year.	Utah's urban and rural areas area growing, education of land users, resource managers, and policy makers will be critical for the protection of landscapes and their users. We will improve awareness, communications, and integration of environmental programs.	Give youth opportunities to become involved with the community, prepare them for adult responsibilities and future employment. Train more youth volunteers. Get youth involved in livestock, dairy, poultry, and horse projects.
CSREES Goal Area, Funding Source	Goal 5: Smith-Lever 3 b (1) and c	Goal 5: State Base	Goal 5: Smith-Lever and State Base
Unit Point of Contact	Steve Daniels, Utah State University Sociology, Social Work, Anthropology Phone (435) 797-1230	Barbara Middleton, Utah State University, College of Natural Resources Phone (435) 797-0151	John Paul Murphy Youth Development Specialist 4900 Old Main Hill Phone (435) 797-2199
Collaborating Unit(s)	CES Units in Nevada, New Mexico, Oregon, Montana and Washington	Various university programs, departments, county extension agents, chambers of commerce, etc.	CES units throughout the Nation.
FTE	.5 FTE	1.25 FTE	9.5 FTE
Required Program Support (all sources)	\$75,000 annually	\$187,500 annually	\$1,425,000 annually

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 5 – October 2004-September 30, 2006**

Program Title	Manufacturing Extension Service	Improving Rural Vitality	Extension Educational Programs on Water Resource Issues: On-Site Wastewater Treatment
Program Duration	Long Term: Two or more years. January 2005-January 2007	Long Term: Two or more years. January 2005-January 2007	Long Term: Two or more years. January 2005-January 2007
Principle Program Goal	Establish a state-wide presence as a manufacturing resource provider for Utah through the Manufacturing Extension Service.	Develop Rural Leadership Forum as organizational and operating partnership among Utah institutions and organizations providing technical assistance and resources to rural Utah.	Expand the delivery of the Utah On-Site Waste Water Treatment program to small communities and areas where small tracts have new home construction occurring.
CSREES Goal Area, Funding Source	Goal 5: State Base	Goal 5: State Base	Goal 5: State Base
Unit Point of Contact	Stephen Reed, Utah State University Manufacturing Extension Service Phone (435) 797-3789	Steve Daniels, Utah State University Sociology, Social Work, Anthropology Phone	Dr. Nancy Mesner, Utah State University Aquatic, Watershed, and Earth Resources, College of Natural Resources, Phone (435) 797-2465
Collaborating Unit(s)	National Institute of Standards and Technology	Western Rural Development Center; Utah Department of Community Economic Development	Utah State University Colleges of Agriculture, Natural Resources, Business, and Humanities, Arts, and Social Sciences (HASS); US EPA, USGS, Bureau of Reclamation, Utah's DEQ, DWR, and Department of Public Health.
FTE	CES: 1.0	CES: .25	CES: .25
Required Program Support (all sources)	CES: \$150,000	CES: \$37,500	CES: \$37,500

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of Work
Goal 5 – October 2004-September 30, 2006**

Program Title	Extension Educational Programs on Water Resource Issues: On-Site Wastewater Treatment	Helping Youth and Families at Risk (UAES added to Extension's ongoing program)	Assisting in Community Economic and Social Development
Program Duration	Long Term: two or more years. January 2005-January 2007	Long Term: Two or more years. January 2005-January 2007	Long Term: Seven or more years
Principle Program Goal	Expand the delivery of the Utah On-Site Waste Water Treatment program to small communities and areas where small tracts have new home construction occurring.	Expand the delivery of the Utah On-Site Waste Water Treatment program to small communities and areas where small tracts have new home construction occurring.	Develop the necessary research-based information to allow rural communities to remain viable it at all possible.
CSREES Goal Area, Funding Source	Goal 5: State Base	Goal 5: State Base	Goal 5: State
Unit Point of Contact	Dr. Nancy Mesner, Utah State University Aquatic, Watershed, and Earth Resources, College of Natural Resources, Phone (435) 797-2465	Dr. Nancy Mesner, Utah State University Aquatic, Watershed, and Earth Resources, College of Natural Resources, Phone (435) 797-2465	Dr. H. Paul Rasmussen Director, Utah Agricultural Experiment Station Utah State University Phone: (435) 797-2207
Collaborating Unit(s)		CES: Various units within Colleges of Business, Agriculture, HASS, Natural Resources, and Education	Units within the Colleges of Business, Agriculture, and HASS
FTE	CES: ____	CES: 5.0 (repetitive) UAES: 1.0	UAES: .5 professional
Required Program Support (all sources)	CES: ____	CES: \$582,000 (repetitive) UAES: State - \$371,837	UAES: Multistate - \$22,834 State: \$66,191

*Professional FTE shown unless indicated otherwise.

**Utah State University Extension and Agricultural Experiment Station Full State Plan of
Work Goal 5 – October 2004-September 30, 2006**

Program Title	Assessing the Impacts of Changes in Rural Communities
Program Duration	Long Term: Seven or more years
Principle Program Goal	Rural communities are encountering substantial changes as their reliance on traditional industries wanes, but little else is available to ensure their continued vitality. The primary goal of this program is to determine what changes are occurring, assessing the impacts of those changes, and developing alternative development strategies where feasible.
CSREES Goal Area, Funding Source	Goal 5, Hatch - Multistate and State
Unit Point of Contact	Dr. H. Paul Rasmussen, Director Utah Agricultural Experiment Station 4810 Old Main Hill Logan, UT 84322-4810 Phone: (435) 797 - 2207
Collaborating Unit(s)	Numerous units within several Utah State University colleges will be collaborating including Business, Agriculture, Natural Resources, HASS, Education, and Engineering.
FTE	UAES: 0.10
Required Program Support (all sources)	UAES: \$124,335 Multistate - \$56,060; State - \$68,275

*Professional FTE shown unless indicated otherwise.

Program Title:

Manufacturing Extension Service

Statement of Issue(s):

Utah's economy has been directly tied to the outputs of tourism and the growth of manufacturing companies within the state. However, the state has been experiencing an economic downturn since the conclusion of the Olympics and the I-15 interstate project. Both projects involved large number of manufacturing jobs to support the construction efforts. In addition, following the events of 9-11, the country as a whole has experienced a recession which has resulted in the loss of many manufacturing jobs in the state. The recession also has caused many manufacturers in the state to look outside of the state and country for products where labor content is considered high.

Performance Goal(s):

Establish a state-wide presence as a manufacturing resource provider for Utah through the Manufacturing Extension Service.

Key Program Components:

The creation of the Manufacturing Extension Service will enhance the visibility of Cooperative Extension along the Wasatch Front where the majority of the manufacturers of the state are located. The thrust of this new program will be to raise the competitiveness, performance and profitability of Utah's manufacturers. The net effect will play a significant role in shoring up the economic impact of the manufacturing industry in the state. In addition, efforts will be made to strengthen manufacturing companies in rural Utah, thus creating and retaining jobs.

Internal and External Linkages:

National Institute of Standards and Technology

Target Audience(s):

Small and medium sized manufacturers.

Evaluation Framework:

NIST MEP survey, Quarterly Impacts reports and case studies.

Output Indicator(s):

Manufacturing Extension Service Program Leader position filled
FOCIS Profile and Strategic Plan
County Agent Training
Discovery Tool Assessment

Outcome Indicator(s):

Increased profitability of small and medium sized manufacturing companies.
Creation and retention of jobs.

Program Duration:

Long Term - two or more years.

Allocated Resources:

CES FTE: 1.0

\$150,000

Education and Outreach Programs:

Manufacturing Extension Service “Discovery Tool Assessment”

Rural Small Business Development Centers

Manufacturing Extension Partnership Center

Utah Rural Summit

Rural Technology Conference

Point of Contact:

Stephen Reed

USU Manufacturing Extension Service

4100 Old Main Hill

Logan, Utah 84322-4100

435-797-3789

sreed@cc.usu.edu

Program Title:

Extension Educational Programs on Water Resource Issues: On-Site Wastewater Treatment

Statement of Issue(s):

Much of Utah’s growth and new home construction is occurring in small communities or on small tracts of farmland. These areas require that home sewage be handled by a septic system. The treated effluent is discharged into the groundwater system. Although an effective method of treating home generated sewage in a highly dispersed community, increasing concentrations of homes is a growing concern. Research has shown that there is technology that can be employed during the installation phase to improve the efficiency of the system. Also, a program of regular maintenance is important to the long-life and efficiency of the system. Homeowners need to understand the capacity and limitations of a home septic system. Homebuilders need to understand the new technology to ensure that installed systems are long-lived.

The Utah State University Water Laboratory has developed a program to inform and educate these audiences. It is known as the “Utah On-Site Waste Water Treatment Program.” It is administered and conducted by Water Lab personnel. They are not formally connected to Cooperative Extension at present. A codicil needs to be developed between the two groups to integrate the program’s activities into the Cooperative Extension system and to broaden the program’s delivery and increase its audience.

Performance Goal(s):

Expand the delivery of the Utah On-Site Waste Water Treatment program to small communities where new home construction is occurring. Expand the delivery of the Utah On-Site Waste Water Treatment program to areas where small tracts have new home construction occurring.

Key Program Components:

The key program component is a program developed by the Utah State University Water Laboratory known as the “Utah On-Site Waste Water Treatment Program.” This program shows the technology that can be employed during the installation of a septic system to improve the efficiency of the system and helps homeowners understand the capacity and limitation of a home septic system.

Internal and External Linkages:

Internal linkages are with the Utah State University Water Lab, subject matter specialists, and county agents.

Target Audiences:

Small communities with septic-tanks handling household sewage.
Landowners with small tracts of farmland where new construction is, or might occur.
Homebuilders in rural areas and septic tank installers.

Output Indicator(s):

Codicil between Utah State University Extension and the Utah State University Water providing the mechanism for program marketing, management, and reporting. Replication of the Utah On-Site Waste Water Treatment Program in rural counties.

Outcome Indicator(s):

The number of homebuilders and septic tank installers who employ technology during the installation phase to improve the efficiency of the septic tank system.

Program Duration:

Long Term - two or more years.

Allocated Resources:

CES FTE: _____

CES: \$ _____

Point of Contact:

Dr. Nancy Mesner
USU Aquatic, Watershed, and Earth Resources
College of Natural Resources
5210 Old Main Hill
Logan Utah 84322-5210
Phone: (435) 797-2465
Email: nancym@ext.usu.edu

Program Title:

Improving Rural Vitality

Statement of Issue(s):

Utah's rural communities face an array of challenges, but they have very limited capacity to address them. If rural Utah is to succeed in addressing the challenges it faces, rural leaders and citizens will need access to a variety of resources and technical assistance beyond what is available in any one place at the present time.

In order to be effective, institutions and organizations that provide technical resources to rural Utah need to offer broader, more sophisticated and better coordinated services than they have been able to offer to date. The time is ripe for rural resource providers to examine ways in which they can combine, coordinate and improve their effectiveness in meeting rural challenges and opportunities.

Performance Goals:

Develop Rural Leadership Forum as organizational and operating partnership among Utah institutions and organizations providing technical assistance and resources to rural Utah.

Identify four or five areas of focus for the Rural Leadership Forum.

Key Program Components:

Partners brought together through written agreement to include, but not limited to:

- Utah State University Extension
- Southern Utah University and the Utah Center for Rural Life
- The Utah Rural Development Council
- The Governor's Rural Partnership Office
- The Department of Community and Economic Development
- The Western Rural Development Center
- Utah Reach Web portal for accessing rural resources and information

Internal and External Linkages:

- Utah Manufacturing Extension Service
- Area Health Education Center
- Utah's Small Business Development Centers
- Utah State University Institute for Outdoor Recreation (IORT)
- Southern Utah University and the Utah Center for Rural Life
- The Utah Rural Development Council
- The Governor's Rural Partnership Office
- The Department of Community and Economic Development
- The Western Rural Development Center
- National Institute of Standards and Technology

Target Audience(s):

Rural elected officials, county commissioners, mayors, city councils, community leaders, economic development professionals, community planners, rural entrepreneurs, and rural residents.

Evaluation Framework:

Document reviews, Rural Leaders Forum self-assessments

Output Indicator(s):

Rural Leaders Forum operating
Focus areas identified.

Outcome Indicator(s):

Number of rural communities, leaders utilizing the Leadership Forum and Resources to engage in community development practices. Number of County Extension offices/agents that are engaged in community development work in their counties.

Program Duration:

Long Term - two or more years.

Allocated Resources:

CES FTE: .25

\$37,500

Education and Outreach Programs:

Manufacturing Extension Service "Discovery Tool Assessment"
Smart Sites
Rural Small Business Development Centers
Home Based Business Programs
Western by Design
Heritage Tourism
Utah Rural Summit
Rural Technology Conference

Point of Contact:

Steve Daniels
Sociology
College of Humanities, Arts, and Social Sciences
Phone: (435) 797-1230

Program Title:

Helping Youth and Families at Risk (**Experiment Station's effort added to Extension's ongoing program.**)

Statement of Issue(s):

There has been a significant increase in delinquency-related problems involving youth in both urban and rural areas. This issue continues to be identified as a key program issue in the statewide stakeholder listening sessions.

Performance Goal(s):

Provide research basis for intervention methods that reduce delinquency-related problems.

Key Program Component(s):

Collaborating scientists primarily from Utah State University Colleges of Education and Humanities, Arts, and Social Sciences (HASS), plus a close relationship with CES' youth development programs (e.g., 4-H).

Internal/External Linkages:

Internal: Departments with the Colleges of Education and HASS, in addition to the youth and leadership development programs that are part of 4-H's responsibilities.

External: External linkages will primarily be between the Utah Department of Human Services and various federal agencies including Health, Education, and Welfare.

Target Audience:

Primarily extension and outreach specialists.

Evaluation Framework:

Extent and nature of publications and related materials released to extension and outreach personnel.

Output Indicator(s):

Measurements of program effectiveness that potentially can occur with alternative intervention methodologies.

Outcome Indicator(s):

New intervention methodologies will be developed that are effective in disrupting the delinquency-related behaviors of youth.

Program Duration:

Long Term - seven or more years

Allocated Resource(s):

CES 5.0 (**repetitive**)

\$582,000 (**repetitive**)

UAES: State - 1.0

\$371,837

Education and Outreach Program(s):

Many of the research scientists involved in this area of work also have an extension appointment. There are also numerous relationships that have been built over time that will facilitate the outreach effort, both within local and regional communities.

Points of Contact:

Dr. H. Paul Rasmussen, Director
Utah Agricultural Experiment Station
4810 Old Main Hill
Logan, UT 84322-4810
Phone: 435-797-2207
E-mail: paul@agx.usu.edu

Barbara Rowe, Utah State University
Family and Consumer Science Program
Leader, Cooperative Extension
Utah State University
Phone (435) 797-1535

Program Title:

Assisting in Community Economic and Social Development

Statement of Issue(s):

Economic and social development are key issues that have consistently been identified in various stakeholder listening sessions across the state. With the continued rapid urbanization along the Wasatch Front and declining communities elsewhere in the state, the economic and social impacts of change are difficult and substantial.

Performance Goal(s):

Effective means of encouraging local economic and social development will be found for rural and urban communities.

Key Program Component(s):

Research and Extension faculty within various colleges within Utah State University including Business, Humanities, Arts and Social Sciences (HASS), Natural Resources,

Agriculture, Engineering, and Education, must collaborate in identifying alternative means of encouraging local economic and social development.

Internal/External Linkages:

Internal: In addition to involvement by research scientists from the University's seven colleges, a close working relationship must be sought and maintained with Extension. The dual appointment many of these scientists have will greatly assist the manner in which information, once generated, can be provided to local community leaders and citizens in general.

External: External linkages will include various State units such as the Department of Community Economic Development, Public Health, Human Services, Agriculture and Food, and Natural Resources. In addition, a collaborative relationship must be developed and maintained with university scientists across the region. Various federal agencies, such as ERS and rural development units, will also be needed. The Center for Rural America, supported by the Kansas City Federal Reserve Unit, is active in developing alternative views regarding the needs and nature of community economic and social development.

Target Audience:

Extension Specialists and county personnel, plus local community leaders and citizens at large.

Evaluation Framework:

Social and economic metrics will be used to determine the effectiveness of this program.

Output Indicator(s):

Nature and extent of publications and presentations will be used as the output indicator.

Outcome Indicator(s):

Using economic and social tools for estimating impacts, the benefits and costs (both in an economic sense as well as a social sense) of alternative strategies will be estimated. The information will be made available to extension specialists, county agents, and state- and local-level community development persons and the breadth of use or implementation of such information will also be used to evaluate outcomes.

Program Duration:

Long Term - seven or more years.

Allocated Resources:

UAES FTE: State - .50 professional
Mutistate -: \$22,834; State - \$66,191

Point of Contact:

Dr. H. Paul Rasmussen, Director
Utah Agricultural Experiment Station
4810 Old Main Hill
Logan, UT 84322-4810
Phone: (435) 797-2207
E-mail: paul@agx.usu.edu

Program Title:

Assessing the Impacts of Changes in Rural Communities

Statement of Issue(s):

That rural communities are changing is widely known. What is not fully known is the nature and extent of the impacts of those changes, both economic and social. This program will estimate the nature and extent of changing rural communities.

Performance Goal(s):

Changes occurring in rural communities will be identified. The exact nature of those changes will be documented. Alternative coping strategies will be developed to assist those going through such transformations.

Key Program Component(s):

Research and Extension faculty within various colleges within Utah State University including, but not necessarily limited to, Business, Humanities, Arts and Social Sciences (HASS), Natural Resources, Agriculture, Engineering, and Education, must collaborate in identifying alternative means of encouraging local economic and social development. Extension faculty will be an essential part of this team due to their direct connection with local communities.

Internal/External Linkages:

Internal: In addition to involvement by research scientists from the University's seven colleges, a close working relationship must be sought and maintained with Extension. The dual appointment many of these scientists have will greatly assist the manner in which information, once generated, can be provided to local community leaders and citizens in general.

External: External linkages will include various State units such as the Department of Community Economic Development, Public Health, Human Services, Agriculture and Food, and Natural Resources. In addition, a collaborative relationship must be developed and maintained with university scientists across the region. Some regional and federal entities will be involved, with special consideration given to the work being done by the Center for Rural America, supported by the Kansas City Federal Reserve Unit.

Target Audience:

University faculty, Extension specialists and county personnel, plus local community leaders and citizens at large.

Evaluation Framework:

Social and economic metrics will be used to determine the effectiveness of this program.

Output Indicator(s):

Nature and extent of publications and presentations will be used as the *primary* output indicator of the changing nature of rural economies.

Outcome Indicator(s):

Using economic and social tools for estimating impacts, the benefits and costs of alternative strategies will be estimated. These measurements will be supplemented by case studies.

Program Duration:

Long Term - seven or more years.

Allocated Resources:

UAES FTE: .10

Multistate - \$56,060; State - \$68,275

Point of Contact:

Dr. H. Paul Rasmussen, Director
Utah Agricultural Experiment Station
4810 Old Main Hill
Logan, UT 84322-4810
Phone: (435) 797-2207
E-mail: paul@agx.usu.edu

SECTION III

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 work from these three institutions.

The Scientific Peer Review Process – Agricultural Experiment Station

The scientific peer-review process within the agricultural station involves two steps. The first step includes a review by two scientists requested by the principal investigator (PI). These two scientists provide written comments regarding the proposal and return them to the PI for evaluation and response. Prior to submission to the experiment station, the PI's department head also reviews and signs off on the proposal. Once the proposal reaches the station, two additional scientific peer reviews are obtained, either from other on-campus faculty (if the expertise exists) or off-campus faculty (if on-campus expertise does not exist). The reviews are returned to the experiment station and the PI's are subsequently asked to respond to issues raised by these reviewers. The PI must then modify his/her proposal to address the issues raised by the "outside" reviewers before resubmitting it to the experiment station for funding consideration. The practice of sending reviews off-campus to qualified reviewers has increased over the past two years.

SECTION IV

MULTISTATE ACTIVITIES: EXTENSION AND EXPERIMENT STATION

Extension Collaborators -

Utah State University Cooperative Extension Service has POW programmatic ties with nearly every western state. Proposed collaboration with the CES units in the states of Idaho, Oregon, Montana, Arizona, New Mexico, Nevada, Wyoming, and Colorado have been particularly helpful as collaborators. Each of these proposed collaborating units have been contacted and provided a certification of collaboration signature document from USU extension specifying the programs in which collaborative relationships either exist or are needed. Interaction with other educational institutions also exist as noted below. When possible, individual county extension units have been encouraged to collaborate on solving like issues and problems where common interest exists between county units. The following list, designated by goal area, represents federal, state, county, and private agency and association collaborators participating in public partnership with USU extension.

Goal 1

Utah Farm Bureau
Utah Farmer's Union
Bureau of Land Management
Utah Cattlemen's Association
Utah Department of Agriculture and Food
Utah Nursery and Landscape Association
County Weed Boards

Utah's Horticulture and Fruit Crops
Utah Wool Growers Association
Utah Dairy Producers Association
Utah State Veterinary Association
Rocky Mountain Dairy Herd Improvement
Association
Environmental Protection Agency
United State Department of Agriculture

Goal 2

Utah Food Safety
HACCP Education Coalition
Utah Restaurant Association
Utah Cattlemen's Association
National Cattlemen's Association
Utah Farm Bureau
Utah Farmer's Union
Utah Veterinary Medical Association
Utah Crop Protection Association

Utah Environmental Health Association
Utah State Office of Human Services
United States Department of Agriculture
Utah Department of Health
County Health Departments
County Advisory Councils
Utah Public Schools
Utah Senior Citizen's Organizations
Homemaker Clubs of Utah

Goal 3

United States Department of Agriculture
Department of Health and Human Services
Utah Nutrition Council
Food Stamp Program

Women, Infants and Children Program
Head Start
Senior Centers of Utah
Native American Tribes of Utah

Goal 4

Utah Division of Wildlife Resources
Business and Community Enrichment Programs
Utah Division of Water Quality
Utah Farm Bureau
Utah Community Forest Council
Tree Utah
State and Private Forestry
Utah Association of Conservation Districts
Farm Services Agency
County Soil conservation Districts
Utah Department of Environmental quality
Utah Division of Water Quality
Western Integrated Ranch/Farm Education Program
Sustainable Agriculture Research and Education
Environmental Quality Incentive Program
Utah Farm Bureau Federation
Utah Cattlemen's Association
Utah Wool Growers Association

Utah Division of Wildlife Resources
Utah Section, Society for Range Management
Utah Department of Agriculture
Utah Farmer's Union
Utah Dairyman's Association
Natural Resources Conservation Service
Bureau of Land Management
United State Forest Service
The Nature Conservancy
Utah School and Institutional Trust Lands
Administration
Utah Grazing Lands Conservation Initiative
Coalition
Utah Weed Control Association
Soil Conservation Service
National Park Service
Department of Defense
Tribal Organizations of Utah
Utah Department of Transportation

Goal 5

Utah's Youth and Families with Promise Program
Local School Districts of Utah
Utah Juvenile Court and Youth Corrections
Utah Health Department
Utah Division of Child and Family Services
Western State's Agricultural Experiment Stations

Utah State Board of Education
Utah State 4-H Ambassadors and District
Ambassadors
National 4-H Council
Western Region State 4-H Programs
State 4-H Teen Specialist Association
National Search Institute

University Collaborators

University of Wyoming
New Mexico State University
Colorado State University
University of Idaho
Idaho State University
University of Arizona
University of Nevada
Montana State University
Oregon State University

Snow College
College of Eastern Utah
Southern Utah State University
Dixie College
Utah Valley State College
Brigham Young University
University of Utah
Weber State University

Agricultural Experiment Station Collaborators

Collaborative efforts between the Agricultural Experiment Station and Extension is specified under Section IV of this plan, entitled "***Integrated Research and Extension Activities.***" These plans detail the multidisciplinary activities of research and extension by staff performing the activity. Of course, many of the collaborators listed above also apply to the Agricultural Experiment Station. Multistate, multidisciplinary, and multi-institutional *project* activities association with the Utah Agricultural Experiment are varied and numerous.

Multi-State and Multi-Institutional

There is a close working relationship between the Agricultural Experiment Station at Utah and those found at other Land Grant institutions throughout the Western U.S. through the national Regional Directors' Association. This region's executive director's position is filled by Mike Harrington, Director. Multistate activities involving Utah State University scientists include:

Goal 1:

NCR-101	W-185	WCC-067
NE-177	W-106	WCC-069
W-177	WCC-001	WCC-077
NRSP8	WCC-037	WCC-081
NRSP4	WCC-039	WCC-094
W-171	WCC-058	WCC-095
W-130	WCC-059	WCC-097
NC-140	WCC-060	WCC-102
NC-185	WCC-066	WCC-091
		WCC-092

Goal 2:

W-122
WCC-020
W-102

Goal 3:

W-191
W-181
WCC-107

Goal 4:

W-192
W-133
NRSP3
W-188
NE-1232
W-045
W-184
W-187
WCC-021
WCC-040
WCC-055
WCC-093
WCC-103

Goal 5:

NCA-013
NE-162
W-167
NC-223
NE-167
NC-217
WCC-084

Extension Baseline Formula Fund Expenditures on Multistate Programs.

Extension's 2003 level of multistate expenditures for FY03 totaled more than \$139,000. This has grown since the inception of the *Plan of Work* process.

Agricultural Experiment Station Hatch Formula Fund Expenditures on Multistate Programs.

Total multistate expenditures for FY03 on multistate activities was over 40% of the total federal Hatch allocation or \$554,145. This is in excess of the 25% required.

SECTION V

INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

Agricultural Experiment Station Integrated Programs:

Goal 1: Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

NAME	TITLE	DEPARTMENT	PROJECT #	% UAES	% CES
Bagley, Lynn	Res Asst Professor	AD&V	471	75	25
Young, Allen	Associate Professor	AD&V	421	27	73
Zobell, Dale	Associate Professor	AD&V	451	24	76
Hill, Robert	Professor	Bio Irrg	797	18	82
Newhall, Robert	Research Associate	PSB	431	14	86
Rasmussen, Philip	Professor	PSB	276	52	48
Varga, William	Director	PSB	427	42	58
Bailey, Deevon	Professor	Economics	016, 017, 085	32	68
Boman, Ronald	Res Assoc Professor	AD&V	418	26	74
Snyder, Donald	Assoc Dean & Professor	Economics	14	20	80
Godfrey, Bruce	Professor	Economics	7	17	83
Dewey, Steven	Professor	PSB	291	19	81
Griggs, Thomas	Assistant Professor	PSB	358	30	70
Koenig, Richard	Associate Professor	PSB	367	18	82
Drost, Daniel	Associate Professor	PSB	344	30	70

Goal 2: To ensure an adequate food and fiber supply and food safety through improved science-based detection, surveillance, prevention, and education.

NAME	TITLE	DEPARTMENT	PROJECT #	% UAES	% CES
Deer, Howard	Professor	AD&V	103	39	61
Jenson, Eleanor	Clin Asst Professor	AD&V	475	50	50
Alston, Diane	Associate Professor	Biology	618, 626	27	73
Bailey, Deevon	Professor	Economics	016, 017, 085	32	68
Sorenson, Ann	Professor	Nutr	237	28	72
Hendricks, Deloy	Professor	Nutr	230	53	47

Goal 3: Through research and education in nutrition and development of more nutritious foods, enable people to make health-promoting choices.

NAME	TITLE	DEPARTMENT	PROJECT #	% UAES	% CES
Bailey, Deevon	Professor	Economics	016, 017, 085	32	68
Sorenson, Ann	Professor	Nutr	237	28	72
Hendricks, Deloy	Professor	Nutr	230	53	47
Drost, Daniel	Associate Professor	PSB	344	30	70

Goal 4: Enhance 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.

NAME	TITLE	DEPARTMENT	PROJECT #	% UAES	%CES
Boman, Ronald	Res Assoc Professor	AD&V	418	26	74
Harrison, John	Assistant Professor	ASTE	942	23	77
Snyder, Donald	Assoc Dean & Professor	Economics	14	20	80
Godfrey, Bruce	Professor	Economics	7	17	83
Blahna, Dale	Associate Professor	Env & Soc	726	51	49
Brunson, Mark	Associate Professor	Env & Soc	710	50	50
Beard, Richard	Associate Professor	ASTE	944	11	89
Evans, Edward	Associate Professor	Biology	524	30	70
Dewey, Steven	Professor	PSB	291	19	81
Koenig, Richard	Associate Professor	PSB	367	18	82
Cerny, Teresa	Assistant Professor	PSB	365	30	70
Drost, Daniel	Associate Professor	PSB	344	30	70
Kopp, Kelly	Assistant Professor	PSB	359	38	63
Rasmussen, Philip	Professor	PSB	276	52	48

Goal 5: Empower people and communities, through research-based information and education, to address the economic and social challenges facing our youth, families, and communities.

No Scientists Identified with Dual Appointments

Extension Integrated Programs:

Integrated Pest Management and Demonstration Fruit Orchard at the USU

Kaysville Experiment Farm (Alston, D.). The focus is development and validation of reduced risk pesticides and alternative pest management strategies appropriate for Utah tree fruit production systems. CONTROL OF WESTERN CHERRY FRUIT FLY (WCFF) WITH CHLORONICOTINYL INSECTICIDES IN TART CHERRY: Chloronicotinyl (CN) insecticides are a primary replacement group for organophosphate (OP) insecticides in tree fruits. CNs are generally more selective for target insects and possess lower mammalian toxicity than OPs. Calypso (thiacloprid) and Provado (imidacloprid) were evaluated in 0.52 acre sized tart cherry plots and compared against a conventional grower standard, Guthion, and an untreated check. Insecticides were reapplied at 14 d intervals following biofix for 3 applications each. At harvest (17 Jul), Calypso plots had a low level of fruit injury (2.7%) while Provado and Guthion fruit were completely clean from fruit fly larvae. All insecticides lowered adult densities from biofix to harvest as compared to the untreated check (number of adults per trap: 213, 349, 620 and 1164 for Guthion, Provado, Calypso and untreated, respectively). Because of high adult pressure in all plots, insecticides must also repel females from depositing eggs and/or kill eggs inserted under the fruit skin. First infestation of fruit occurred in untreated plots (on 13 Jun) when fruit color changed from yellow to rosy and was soft enough for a cherry penetrometer to register a firmness reading. The first fruit infestations in Calypso plots occurred 13 days later than in untreated trees (on 26 Jun) when fruits were rosy to red in color and easily penetrated by the penetrometer. A downside to use of chloronicotinyls is their potential for mite hormoligosis, stimulation of mite feeding and reproduction. We observed hormoligosis effects for both Calypso and Provado on phytophagous mites during peak populations on 30 Jul. So although CNs are efficacious replacements for OPs for control of WCFF, mite hormoligosis is an undesirable side effect. DEMONSTRATION OF CODLING MOTH (CM) CONTROL IN APPLE WITH DIAMOND

(NOVALURON): Diamond is a new insect growth regulator (IGR) that is slated for EPA registration on U.S. pome fruits in 2004. An insecticide rotation program was demonstrated in the center of a 2-acre apple orchard and compared to bordering untreated rows (3 or 4 rows on each side). The rotation was 2 applications of Diamond followed by one application of Guthion for each of two CM generations. Applications were timed with moth activity and a degree-day model. At harvest (20 Aug) untreated fruit had a mean of 50.3% larval entries as compared to 1.3% larval entries and 8.3% stings for the Diamond/Guthion program. The IGR, Diamond, appears to be an effective reduced risk insecticide for CM control and suitable for rotation with other insecticides in a resistance management and reduced toxicity insect control program. 4TH YEAR OF PHEROMONE MATING DISRUPTION (MD) FOR GREATER PEACH TREE BORER (GPTB): A fourth consecutive year of Isomate-P MD was demonstrated for control of the trunk boring clearwing moth, *Synanthedon exitiosa*, in small sized peach blocks (<1 acre).

Impact: The development of alternative pest management strategies and the testing and demonstration of more selective, lower toxicity pesticides is essential to the sustainability of the Utah tree fruit industry. The Utah Tree Fruit IPM project functions to develop and validate new pest control tools that local producers can readily adopt.

Management of Intensive Grazing on Irrigated Pastures for Dairy (Boman, R.)

Twenty-four cows in 1st and 2nd lactation averaging 145 days in milk were randomly allotted to 3 treatment groups of 8 cows each based on milk production and days since calving. Treatment 1 cows were housed in confinement dry lot corrals and fed a balanced total mixed ration (TMR). Cows on the other two treatments were adjusted over a 4-week period to grazing an intensively managed perennial ryegrass/white clover (PRG) pasture during which time they received 12 kg of 70% dm TMR twice daily 1 hr prior to being milked. After the 4-wk adjustment period, cows on TRT 2 received 9 kg of TMR twice daily plus free access to pasture. Cows on TRT 3, also on pasture, received the equivalent dm of TRT 2 from corn silage and a concentrate mix twice daily. Pastures were sprinkle irrigated (5cm water/7 to 10d) and nitrogen fertilizer was applied with each sprinkling (190kg/ha/season). Electric fences permitted small paddocks for 12 hr grazing of vegetative growth (15 to 20 cm tall). Milk production averaged 36.2 kg/day 2-wk prior to the start of the trial. During the 4-wk adjustment period milk production declined 1.04, 8.94 and 10.21% for the respective treatments (1, 2 & 3). Average milk production by the end of the 17-wk treatment period declined 24, 30 and 48% for the respective treatments. The milk decline of cows on pasture was greater ($P < .05$) than the dry lot fed cows during the 4-wk adjustment and the first 4 wk of the treatment period. TRT 3 cows after wk 4 failed to consume more than 70 to 80% of their corn silage/grain mix resulting in lower milk yield ($P < .05$) compared to TRT 1 & 2. Another reason for the lower production on pasture is that the PRG, a short lived perennial, was losing yield and quality compared to previous years. The two groups of cows on pasture lost weight ($P < .05$) the first 3 months but the final weights were not different ($P > .15$). In another experiment, 30 Holstein heifers averaging 371 kg body weight were randomly allotted to 3 treatments of 10 heifers each. Group 1 heifers remained in dry lot and were fed a standard (TMR) ration. Groups 2 and 3 grazed either irrigated orchard grass/white clover (OG) or perennial ryegrass/white clover (PRG) pastures for 148 days. Drinking water and a mineral package (w/Bovatec) were always available in each grazing paddock. Heifers were moved to a fresh paddock every 24 to 36 hours. Pasture was maintained in a vegetative stage of growth (15 to 20 cm tall). Average daily weight gains were 1,067, 935 and 776g for TMR, OG and PRG, respectively. While heifer daily gains of 800 g are adequate, those grazing PRG were lower ($P < .05$) than TMR and OG. PRG is a short lived perennial and this year the yield was reduced. OG was ready to graze 14 days before PRG in the Spring. Even though PRG can be established quickly and be grazed sooner, it is not as durable and persistent as OG for grazing.

Impact: Intensively managed irrigated perennial ryegrass and orchardgrass pastures w/white clover offer an alternative to total confinement dairy production. Milk production of cows on pasture was lower than with dry lot feeding but, with proper supplementation of the cows and with persistent stands of high quality pasture, the cost/kg of milk should favor pasture. Grass based dairies that graze both calves and heifers prior to the initiation of lactation should not experience a drastic lowering of milk production when cows are switched from TMR rations to Spring grazing.

Biological Control in Pest Management Systems of Plants (Evans, E. W.)

Studies were continued of biological control of insect pests in alfalfa, and of weeds in Utah rangelands. Long-term sampling of alfalfa fields was continued in 2003 to determine population sizes of the introduced predators *Coccinella septempunctata* and *Harmonia axyridis*, as well as of native lady beetles and pea aphids. Results were similar to those of recent years in revealing continuing low density populations of native lady beetles and pea aphids following the successful establishment of *C. septempunctata* in northern Utah. *H. axyridis* again occurred in only low numbers in alfalfa fields in 2003, although it was much more abundant in nearly arboreal habitats. Field experiments were conducted to measure the degree to which adult lady beetles of different species aggregate independently of each other in response to high population density of aphids. Long-term field experiments and establishment studies were continued for insect biological control agents for a number of Utah weeds, including squarrose knapweed and Canada thistle. Dissections of squarrose knapweed seedheads collected throughout central Utah in 2002 (another dry year with little flowering activity) revealed infestation rates by insects (especially the seed-head fly *Urophora quadrifasciata* and the weevil *Larinus minutus*) to average only 27% at individual sites (versus 68% the previous year, and 1% in 1993 when insects were first introduced). Intensive field sampling at individual sites was continued in 2003 to document the seasonal patterns of attack of these biocontrol agents, and associated seasonal patterns of successful seed production by the host plant.

Impact: 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.

The Management Style and Competence of Dairy Farmers as an Indicator of Profitability and Productivity (Young, A. J.)

This past year the CRIS project was rewritten with one objective continued, one dropped and two others added. The objective that was retained and the only one that I worked on was the use of control charts for summarizing information on a dairy to enhance the ability of a dairy farmer to make appropriate decisions. The demand for these charts has increased and I usually create from 6 to 72+ control charts for individual dairy farms in Utah, Idaho, Wyoming, Montana and Nevada. I have three herds that I work with closely to monitor daily bulk tank production values and compare with ration changes or management decisions to determine the effects on production and income. These charts have been used as part of management team meetings with the dairy farmer, veterinarian, feed consultant and management consultant. As was mentioned last year, most ration changes did not result in changes in bulk tank milk levels or milk components. Also, many production changes in either milk yield and/or components did not necessarily translate into increased income because of the volatility of the market. We now are using control charts that combine milk yield and component percentages into pounds of fat or protein as a monitor to determine if production has really changed. In addition to production and income, we monitor dry matter feed intake and combine with income to develop benchmarks for the whole herd as well as individual strings. As we continue to add/develop new charts, the value to the management meetings has grown. A discussion at a management meeting lead to the monitoring of the differences between the pounds of milk as reported by the processor and those reported by the milk meters in the parlor. The two values should be approximately the same, yet the differences (this is a new parlor) were significant and required the service company to recalibrate the meters sooner than expected. From these control charts the company was able to determine that meters should be recalibrated more often than manufacturer recommendations. In addition, this same dairy farm had a serious health problem outbreak that required the company that made their vaccine to do a site visit to determine if the problem was product related. We used control charts to summarize the health data and the Technical Service Veterinarian for the company said that as soon as he saw the process control graph of death loss and the vaccinations his job was done. He said this by far was the best and most correct way of looking at the data. He also planned on sending copies to the rest of the Tech service in this company. Control charts are becoming valuable on these farms when used at team meetings with the consultants, nutritionists, and dairy farmer in making management decisions.

Impact: Control charts can aide the dairy farmer and consultants in making management decisions by separating the day-to-day variability from real changes that can have production, health and economic consequences.

The Utilization of Technologies to Improve Economic Returns Through Retained Ownership of Calves (ZoBell, D.)

Six studies were performed involving whey silage. The objectives of these studies were to determine if silage could be produced from sweet liquid cheese whey, small grain straw and wheat middlings, and to determine its effect on production and digestibility when utilized in growing and finishing diets for cattle. The cheese whey used in the six studies came from two different cheese plants. The batches of whey used for each study varied in dry matter and nutrient content. Whey silage was produced in these studies for less than fifty dollars a ton at a time when corn silage and alfalfa hay were priced at one hundred dollars a ton. When diets containing 55 and 80 percent whey silage were fed to growing steers, they were equal in digestibility to standard diets comprised of alfalfa hay, corn silage and barley grain. The cost per pound of gain was decreased in studies with growing cattle where 55 to 98 percent of the ration was comprised of whey silage. The economic advantage was not recognized in finishing rations that contained only 12 to 18 percent whey silage. Nevertheless, average daily gain was equal in control and treated groups within each of the six studies indicating that animal performance is not compromised when whey silage is included in the ration. A decision to use whey silage in cattle rations would need to be made on a case by case basis after determining the cost of available feedstuffs. Other studies have been conducted or are currently underway to determine the potential for feeding whey silage to reduce the feed cost for beef cow maintenance. Preliminary results indicate that winter feed costs can be reduced by up to 30% when whey silage is used as the main feed component. Other studies evaluated wheat midds as a potential feedstuff for growing and finishing beef cattle. These studies suggest that WM can be included in growing and finishing diets at up to 50% of the diet DM without adverse affects on production, carcass characteristics or ruminal fermentation. Research was also conducted to determine the effect of processing chopped corn prior to ensiling to determine feedlot production and diet in vivo digestibility and growth of characteristics of growing beef replacement heifers. Processing significantly reduced the number of whole kernels in corn silage, and increased NDF digestibility, but did not improve heifer performance on diets containing 55% corn silage. This study showed that corn silage kernels are affected by processing and there is a numerical trend for improved ADG and FE. The evaluation of an accelerated concentrate feeding program on Holstein calves from weaning to slaughter and the effects on production and carcass characteristics was another study conducted at the UAES. It was determined that young Holstein calves should be placed on rations high in energy as levels of efficiency are significantly higher than forage-based diets. High levels of efficiency can be achieved early in a feeding period where the ration consists of high concentrate levels. Economic returns for accelerated and control treatment groups were positive, which was primarily due to low feedstuff prices.

Impact: Most of the studies conducted over the 5 year period of this project were using residue feeds or nontraditional approaches to production. Results have provided new information for beef producers which are applied in nature and have potential to decrease costs and increase viability. Savings of up to 30% in winter beef cow costs and decreases in cost of gain of up to 30% for feedlot cattle are possible by using nontraditional feeds or alternatives. This could be significant for Utah beef producers who adopt these strategies.
