TO: Bart Hewitt

FROM: Milan Rewerts, Director

SUBJECT: Annual Report of Accomplishments and Results from Colorado

DATE: April 15, 2003

Attached is our 2002 Annual Report from Colorado summarizing our major programs under federal themes and the five national goals.

For your information, we have included the original goal statements from the Plan of Work filed in 1999. This included a situation statement and projected outputs and outcomes for each goal. We have then inserted an executive summary under each goal for the year 2002, and we have inserted actual 2002 outputs and outcomes under each goal. There are one or two objectives for which we currently have no outcome information due to resignation or travel schedules of specialists. We wrote a summary which reflects the numerous challenges we have met this year eg. Drought, fire, West Nile Virus, etc.

In the section on resources, we have changed the FTEs only for the column headed 2002-2003 to reflect both state and county FTEs and the 2002 salary equivalent of their time. If you have specific questions regarding any of this information, please contact Associate Director, Mary McPhail Gray at email: mgray@coop.ext.colostate.edu or call her at 970-491-6281.

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2002
Annual Report
of
Accomplishments & Results
for the
Colorado 1999 -2004
Plan of Work

Colorado State University
Cooperative Extension
(April 2003)

State Programs

Introduction

In 2002, Colorado State University Cooperative Extension reassessed its ongoing programs and categorized them as seven Base Programs, nine Critical Issues Programs, and four on-going Organizational Commitments.

Organizational Commitments:

Organizational commitments are those over-arching strategies or perspectives that are diffused throughout all program work. These are:

--Community-Centered Work
--Diversity
--Family & Youth Voices
--Leadership & Volunteerism

Base Programs and Critical Issues share these characteristics:

--Have a Plan of Work in e-POWER (Colorado's electronic accountability system) with documented impacts
--Include interdisciplinary teams and strategies
--Include state, regional, and county faculty
--Plan dynamically using the Logic Model

Base Program characteristics:

--Focus on sustained issues and educational needs
--Contribute expertise to many Critical Issues
--Parallel some Base Programs at the USDA level

Colorado's Base Programs operate through Action Teams outlined below:

■**Engaging Communities in Transition** – Sheila Knop
Entrepreneurial Agriculture and Forestry – Rod Sharp and Dennis Kaan
WestLand: the Workshop – Sheila Knop and Lois Illick

■**Enhancing Families and Community** – Jan Carroll and Laurel Kubin
Increasing Family Economic Stability – Jacque Miller and Judy McKenna
Nurturing Families – Robert Fetsch
Financial Security in Later Life – Jacque Miller

■**Growing Horticulture in Colorado** – Steve Newman
Master Gardeners – David Whiting
Partnering for a Green Colorado – Jim Klett and Carl Wilson

■**Improving Nutrition, Food Safety and Health** – Jennifer Anderson
Food Safety and Quality – Pat Kendall
Food Security – Karen Wilken
Health Promotion / Disease Prevention – Jennifer Anderson

■**Strengthening Youth Development** – Sue Cummings
Curriculum Development – Sue Cummings
Leadership and Volunteerism in 4-H – Dale Leidheiser
Special Initiatives – Jan Carroll

■**Sustaining Agriculture and the Environment** – Dennis Lamm and Kenny Smith

Critical Issues characteristics:
--Focus on a current critical concern for Coloradans
--Generally are in place for a shorter time period
--Tend to require rapid responses with immediate reallocation of resources

Current Critical Issues:
■ Addressing growth decisions
■ Addressing issues of later life
■ Coping with drought
■ Exploring opportunities for Colorado's workforce
■ Preparing for animal emergencies
■ Preventing and recovering from forest fires
■ Supporting small-acreage owners
■ Understanding biotechnology
■ Understanding water quality, quantity and access

In general, Program Teams are comprised of state and county Extension faculty and University faculty without Extension appointments from a variety of disciplines. They are organized to respond to current political, environmental and economic concerns and bring creative interdisciplinary work to bear on these program areas. These Base and Critical Issue Programs contribute to the five federal goals with the following linkages:

Goal I. An agricultural system that is highly competitive in the global economy.
Colorado Program Teams:
Coping with drought
Expanding opportunities for Colorado's workforce
Growing horticulture in Colorado
Preparing for animal emergencies
Supporting small acreage owners
Sustaining agriculture and the environment
Understanding biotechnology
Understanding water quality, quantity and access

Goal II: A safe and secure food and fiber system.
Colorado Program Teams:
Coping with drought
Improving nutrition, food safety and health
Strengthening youth development
Understanding biotechnology
Understanding water quality, quantity and access

Goal III: A healthy well-nourished population.

Colorado Program Teams:

- Coping with drought
- Engaging communities in transition
- Improving nutrition, food safety and health
- Strengthening youth development
- Sustaining agriculture and the environment
- Understanding biotechnology
- Understanding water quality, quantity and access

Goal IV: Greater harmony between agriculture and the environment

Colorado Program Teams:

- Addressing growth decisions
- Coping with drought
- Growing horticulture in Colorado
- Improving nutrition, food safety and health
- Integrating natural resources
- Preparing for animal emergencies
- Preventing and recovering from forest fires
- Strengthening youth development
- Understanding biotechnology
- Understanding water quality, quantity and access

Goal V: Enhanced economic opportunity and quality of life for Americans

Colorado Program Teams:

- Addressing growth decisions
- Addressing issues of later life
- Engaging communities in transition
- Enhancing families and communities
- Expanding opportunities for Colorado's workforce
- Supporting small Acreage
- Understanding biotechnology

A continuing development of Colorado State University Cooperative Extension in the year 2002, is the enhanced populating of our new electronic reporting system, ePOWER (electronic Plan of Work Evaluation & Reporting System), with plans of work and outcome reports. We are able to generate reports to use in staff performance reviews, impact reports, and a variety of media pieces. For this report, all impacts attributable to Cooperative Extension programming are results of searches on the ePOWER database.

2002 System Priorities for Colorado

Critical Challenges in the Year 2002

The year 2002 was marked by challenges, which resulted in reallocation of program effort to new areas of immediate need. This caused both stress and creativity in the system, as well as reinforced relationships among those who are excellent team members.

Economic Downturn

Colorado is particularly sensitive to the economic downturn experienced by the United States as a whole. Its economic dependence on technology-related industries is twice that of the national average. In 2002, its unemployment rate was three times the national average. As noted in *Appendix A* under ***Colorado Economic Issues and Trends,*** Colorado jobs have been particularly impacted in the construction industry, technology, communication industry, travel, and tourism. Home building has declined over 20% and income growth was cut by two-thirds. Clearly, apartments and commercial real estate were overbuilt and the residential housing market is expected to be flat in the year 2003. In addition to the overall economic depression, Colorado's cost of living has been high. During 2002, Colorado scholars completed a cost of living inventory showing the range of costs in different counties in the state *(see Appendix A)*. This information is used by local decision-makers, grant-writers, and individuals trying to recruit businesses into different areas of the state.

Another challenging economic influence on Colorado is the current public-finance regulation environment. In 1982, the Gallagher constitutional amendment, and in 1992, the Taxpayers Bill of Rights (TABOR), have resulted in a public-finance climate that is adequate in good economic times, and handicaps recovery and growth in less positive times. In addition to the specific limitations on public budgets, the current public-finance regulation language is complex enough that many local decision-makers have difficulty understanding allowable practices.

While the Colorado Front Range has grown dramatically, including Douglas County as one of the fastest growing counties in the country, there were five Colorado counties that lost population at the last census. This has created economic regionalization with tremendous contrasts. The state demographers' analysis of Colorado's base economy divides the state into the following eight base industries, each of which has unique economic drivers and differing needs for education and services:

1. Agriculture
2. Urban/suburban/exurban
3. Scenic
4. Ski resorts
5. Energy production
6. Gaming industry
7. Prisons
8. Retirees

Drought

In 2002, Colorado experienced its worst drought in 100 years. The dramatic third year of drought resulted in water reservoirs as low as 20% of normal capacity. This not only affected the tourism industry by decreasing water available for ski resorts and for rafting and boating activities, it also contributed to a dramatic fire season. In 2002, a half million acres of forest were burned in Colorado. The dramatic intensity of these fires demanded extreme responses from local citizens, all fire-fighting personnel, and the county, state and federal governments. Colorado has much aged forest land in which the lack of aggressive management of undergrowth has resulted in a fuel-loaded system. There is concern that even teaching about defensible space and other best management practices cannot impact a state that for so many years utilized management strategies that increased vulnerability to forest fires. In addition, there are many "red zones" in Colorado, where property owners have built in densely wooded areas with a lack of regard for accessible public safety services. It is likely that the natural resources of Colorado will be vulnerable to continued drought, fire and uncontrolled growth.

Colorado agriculture contributes approximately $16 billion to the state's 2002 gross product of $168 billion. With the extreme drought in 2002, severe effects were seen in the livestock industry and field and row crops. In 2002, Colorado harvested the smallest wheat crop since 1968. Estimates from around the state are that approximately 80,000 head of livestock were sold to respond to reduced pasture and feed availability.

Chronic Wasting Disease

Chronic Wasting Disease is a neurological disease of deer and elk and was originally identified in a deer herd in northern Colorado. Particularly because of the public's fear of Creutzfeldt-Jakob disease in humans, this prion disease has caused citizen alarm, but it also engenders concern for the viability of the large hunting-tourism activities in Colorado. Originally, it was felt that Chronic Wasting Disease would not move east over the Continental Divide, but that did occur, and significant culling of herds of elk and deer were necessary in spring, 2002. Colorado State University played a significant role in this process. Special funding financed the purchase of a digester to dispose of diseased carcasses. An elaborate system for surveillance and testing of game harvested by hunters was developed throughout the state of Colorado. Samples are forwarded to the Diagnostic Laboratory at the College of Veterinary Medicine and Biological Sciences at Colorado State University.

West Nile Virus

In spring, 2002, the equine industry was hit by an epidemic of West Nile Virus that moved rapidly from the East Coast. Two months prior to the first cases being discovered in Colorado, the state's animal health professionals did not believe Colorado was vulnerable to this disease. The disease is carried by mosquitoes cycled through contact with diseased birds. Humans also become ill from the disease and unvaccinated horses are seriously impacted by contacting the disease. In both Chronic Wasting Disease and West Nile Virus, our Preparing for Animal Emergencies Issue Team met and worked closely with the Veterinary Teaching Hospital, Diagnostic Laboratory and veterinarians on the Fort Collins campus and in two satellite diagnostic laboratories in the southeast and the southwest parts of the state. Educational materials were developed in the form of brochures, Websites, and PowerPoint presentations so that county faculty could engage in educational activities. CSU Extension faculty participated in a research project to help test the effectiveness of a new vaccine by recruiting horse owners whose animals were used as test subjects.

Public Policy Institute

Over the past three years, Colorado State University Cooperative Extension and the Agriculture Experiment Station have worked actively with five deans and the Vice Presidents to initiate the concept of a Public Policy Institute on the CSU campus. The mission of the institute would be to respond to the research and information needs presented by critical issues in the state of Colorado. The immediate issues identified as top priority are those related to the changing structure of agriculture, natural resource challenges and conflicts, and the increasingly diverse needs of Colorado's population. Before severe economic times depressed the state's economy, Cooperative Extension and the Agriculture Experiment Station had contributed funding to the development of this institute. Additionally, there were commitments from the Colleges of Agriculture, Natural Resources, Applied Human Sciences, Veterinary Medicine and Biological Science, and Engineering. As the economy tightened and the University experienced budget rescissions, Colleges became wary of investing in an integrative joint project. Consequently, the Vice President for Research and Technology as well as the Vice President for University Advancement and the Provost committed their support to an on-going advisory committee and fiscal support for the first two years of the institute. This would enable us to search for an executive director and begin the process of strategic planning, relationship building and initial product development. Over the planning cycle, a group of faculty has been identified who need and actively use publicly available databases to translate trends and identify critical needs of the state. A national search for an executive director was begun in the fall of 2002. At a time of very tight budgets and the need to re-prioritize commitments, the willingness of the Vice Presidents and Provost to invest in this new outreach institute is a strong comment on the vision and commitment of Colorado State University to the public needs of the state.

Reporting/Accountability/Marketing

During this year, system energy again supported the enhancement of two new systems for accountability and reporting. The first is our ePOWER electronic database, which incorporates plans of work and outcomes/impact indicator data. This database was designed in 1999-2000 and we required the system to use it for program information for the first time in 2001. It is unique in that we have the complete plans of work for all of our state program teams, all regional teams, and county teams, as well as individual specialists or agents who are working on plans by themselves. The logic model of program development and evaluation is the conceptual base for ePOWER. It has a rich database of help screens to assist people in effective use of this program. For the second year we are filing a federal report based on data pulled from this electronic system.

A second technology commitment was to create and enhance a frequently-asked-questions, Web-based intelligence system using the copyrighted RightNow Technologies software. We asked county and state faculty to identify major program topics appropriate to our mission and to populate this database with their most frequently-asked-questions with answers. An advisory committee of state and county faculty identified major topics and provided guidance for persons asking questions of the system. As of March 1, 2003, we had approximately 3000 questions and answers in the system. All questions and answers are reviewed before being made public.

Midway into 2002 we selected a name for this new resource through a system-wide brainstorming and voting process. "Answerlink" was selected as the name and we obtained the domain address: "Answerlink.info." We began marketing this system to the public through a variety of methods. Marketing brochures were developed on the following topics: consumers, gardeners, small acreage owners, and foods and nutrition. These materials along with staff training

materials and news releases are available on our Cooperative Extension Website. The Answerlink system will allow users to enter and ask a question by matching their interests with a number of categories and keywords already in the system. They also can search a suggested list of the most frequently-asked-questions in Colorado. Furthermore, they can enter a unique, new question that will be routed to a state specialist for an answer. Once a unique question is answered, and the text of the answer is approved, it is made available in the public side of the database. Our goal is to free county and state faculty for more meaningful dialogues which require professional judgement for appropriate response, while providing access to questions in a quick and efficient manner. As of March 25, 2003, Answerlink had received 105,061 Web hits and visitors had submitted 481 new questions to the system. *The URL is answerlink.info and a general marketing fact sheet can be found in Appendix B.*

Diversity

In addition to the work on new resources and programs, Colorado State University Cooperative Extension made a concerted commitment to diversity in 2001 by organizing its entire Fall Forum Conference on the diversity theme. Colorado is one of the "Change Agent States for Diversity," and has a strong state diversity committee led by a Colorado State University Cooperative Extension diversity coordinator. During a fall forum, diversity was defined in a broad sense from underserved audiences to cultural and racial diversity and to audiences with different learning styles. The evaluation of the conference was that it was the most impactful and helpful conference that CSU Cooperative Extension has held in many years. In 2002, Colorado continued its diversity work through action committees including: Profile Improvement, Valuing Differences, Communication, and Managing Diversity Through Skills Development. The system made a commitment for its entire administrative team to host and attend the L.C. Cross Training in the spring of 2003.

Stakeholder Survey and Interactions

As part of our continuing commitment to outreach and hearing from stakeholders, Cooperative Extension co-funded a replication of a research study of Coloradans' attitudes toward agriculture. First completed in 1996, a faculty member in the College of Natural Resources and a representative of the Colorado Department of Agriculture surveyed a random sample of 450 individuals by telephone. Key findings were that Coloradans generally felt that agriculture protects a positive quality of life and provides food at reasonable prices. One difference from 1996 was a new question regarding how safe genetically-engineered food is to eat, which revealed only 36% of respondents believed that it is usually or almost always safe. Another new finding was that 64% of the respondents indicated they would buy more Colorado identified products if they were available. A number of the data summary points illustrate an increasing diversity of opinions about current practices and understanding of agricultural production. However, there is still overall a very positive view of agriculture and interest in protecting open lands for agriculture and natural resource use.

In 2002, four researched data papers were developed to provide a common information base for a process of program planning for the next decade. Campus meetings began in 2002, regional meetings across the state will occur in spring and summer of 2003, and the process will culminate with the 2005-2009 Plan of Work due March 1, 2004. *See Appendix A for the four trend papers.*

Biosecurity and Public Safety

Following the events of September 11, 2001, the entire Extension system absorbed tremendous grief and shock and re-prioritized the importance of public safety and community building. In Colorado, we created an interdisciplinary group of campus scholars with expertise and interest in biosecurity and began the process of dialogue about how our lives had changed and what information we should provide to the public. We planned a series of public forums and training for Extension personnel that were presented in 2002.

During 2002, the Assistant Vice President for Research initiated a planning process at local, regional, state, and national levels to develop a Rocky Mountain Biosecurity Institute housed at Colorado State University. The institute is conceptualized as a regional (Rocky Mountain States) institute that takes advantage of the tremendous resources in the land-grant system and our federal partners. With a number of federal installations throughout this region, the institute is conceptualized as a safety net against the intentional or accidental biological, radiological or chemical threats to our population. A part-time director of the institute has been hired and on-going conversations have been held with Cooperative Extension directors and Agriculture Experiment Station directors in the Rocky Mountain states, members of our congressional delegation and state legislature, key state departments, administrators within USDA and within the Office of Homeland Security. In addition, the Assistant Vice President has presented to local, county, regional, and state meetings of Cooperative Extension personnel to acquaint them with the potential resources and role that Extension might play in this overall institute.

In collaboration with these efforts, we supported the efforts of two faculty members, one in Bioagricultural Sciences and Pest Management and one in Soil and Crop Sciences to initiate training and grant writing in the area of ethical issues in agriculture. Since increasing numbers of our most critical programming challenges are issues related to public controversy and the clash of public/private values, we believe it is important to enhance the internal dialogue concerning these challenges. In addition we have appointed a professional development committee to create a two-day base training on handling controversial issues at the community level. This interdisciplinary committee is charged with enhancing the capacity of the Colorado State University Cooperative Extension system to facilitate civic dialogues around critical issues for which the land-grant university has expertise and responsibility. A number of these issues are reflected in the creation of our four new programming areas: Understanding Biotechnology, Expanding Opportunities for Colorado's Workforce, Addressing Growth Issues, Empowering Family and Youth Voices. During our annual subject matter professional in-service for the system, we highlighted the importance of these four new program areas. Educational sessions were enriched by a great variety of faculty members, many of whom were from other campuses and/or do not have Cooperative Extension appointments.

Plan for Agriculture

Another major commitment of our system was to work as an important partner in the development of a *Colorado Plan for Agriculture*. Colorado State University President Albert Yates initiated this intensive process, which involved faculty discussions, production of initial draft papers, meetings throughout the state of Colorado with stakeholders, and the development of a strategic plan *(see Appendix D)*. In 2002, the plan was presented to stakeholders, our own staff and other appropriate audiences. As part of this process of reflecting on our priorities for the university, intensive discussions were held between the Colleges of Agricultural Sciences and Natural

Resources to consider integration or some new collaboration structure. Ultimately the decision to not join the two colleges reflected the realities that they represented contrasting cultures with different stakeholder groups. A deliberate process of initiating greater visibility for collaborative projects and virtual institutes will be initiated as an interim step toward fuller cooperation at some future date.

Legislative Initiative and New County Agreements

Colorado State's three agencies (Cooperative Extension, Agricultural Experiment Station, and Forest Service) were successful with the support of the university, the Board of Agriculture and the Higher Education Coordinating Board in obtaining funding for three new initiatives during the legislative session of Spring 2001. For Cooperative Extension this meant the funding of seven (7) new county faculty positions, and access to new funding in collaboration with AES around noxious weed management and education. While the state began conservative spending patterns post-9/11, we still filled these new positions at the county level. In addition, one new Colorado county was formed during the 2000 general election and one of the six counties in Colorado where we do not presently have a county extension office initiated plans for a joint MOU with Colorado State University Cooperative Extension. In the 2002 legislative session, funding was obtained for the next set of Agency Initiatives: forest health, food safety and the public policy issues attributable to changing economic-social-environmental conflicts. However, due to the ordered rescission of 9% of the University's budget, these funds were captured into the general fund for the university.

GOAL I: An agricultural system that is highly competitive in a global economy.

Issue: *Despite its urban and suburban growth, Colorado still has a strong agriculture base but has an increasingly differentiated economy with strength in the tourism and technology-related industries. The depressed commodity prices and the international markets create new challenges for traditional producers. Current research shows only 10% of livestock producers and 40% of grain producers implement some risk management tools. These factors contribute to an increased need to emphasize management skills, in addition to production expertise in all Extension agricultural programs.*

Colorado Situation Influencing Goal I

Livestock Production

Production of meat-producing livestock is a significant portion (56.7%) of Colorado's total cash agricultural receipts. Of these receipts, 87.9% ($2,149,157,000) were from the sale of cattle and calves (USDA, 2000). Colorado's farm and ranch operators had 3.05 million head of all cattle and calves on hand as of January 1, 2002, down 3% from the 3.15 million head one year earlier (Colorado Dept of Ag, 2002). Colorado ranks 4th in the nation in cattle on feed and commercial cattle slaughter representing 7.3% of all cattle slaughtered under federal inspection. It also ranks 1st in lambs on-feed and lamb slaughter with 34.6% of federally-inspected lamb slaughter occurring in the state. Although commercial hog slaughter in Colorado is relatively small (228,000 head during calendar year 1999), total hog numbers have steadily increased from 220,000 in1988 to a current inventory of 780,000 head (Colorado Dept of Ag, 2002).

With the large numbers of market livestock, in addition to two of the largest beef and lamb slaughter facilities in the U.S., the quality, safety and demand for red meat is essential for the economic sustainability and profitability of the Colorado livestock industry. Strong cattle prices and a third, consecutive year of improved beef demand were prominent features of the 2001 cattle market, however, subsequent years have produced challenges for the red meat industries including continued dry weather, uncertain future demand and concerns over the future health of the economy. Many cattle producers face poor pasture conditions, while cattle feeders also face much red ink.

Grains

Colorado corn and other feed grain prices tend to be dominated by developments in other states, especially the Midwest and by international conditions. The national cash corn price received by farmers for the 2001 crop marketing (ending September 1, 2002) year is estimated at $1.95 per bushel. This is slightly higher than a year ago, but remains $.50 to $1.00 lower than the 1995-1999 five-year average. Looking ahead to the 2002 marketing year, the dominant factors in the feed grain markets will be U.S. corn supplies, usage, and the new farm bill.

Colorado feed grain producers and livestock operations need to keep an eye on government policy. Changes in government policy can impact corn prices and hence farmer income and costs of raising livestock. As of late 2001, conflicting proposals and policy perspectives emerged on the new Farm Bill. Even if a new long-term Farm Bill emerges, will it need to be periodically adjusted to reflect budget limitations? Another longer-term policy dimension that may impact feed grains is the international trade environment. Now that China is

part of the World Trade Organization, will Russia and other countries follow? Will new trade agreements be successful in reducing barriers to U.S. agricultural exports? And will U.S. farm programs require adjustments to comply with those international agreements?

Oilseeds/Sunflowers

Colorado farmers planted 22% more acres of oilseeds/sunflowers (225,000 acres) in 2001 as compared to 2000. Overall in 2001, plantings in the U.S. totaled 2,750,000 acres, a decline of just 2% compared to 2000. On the other hand, Colorado producers harvested 226.8 million pounds of sunflowers, 131% of the 2000 crop.

Dry Beans

As with total U.S. production, Colorado saw a reduction in acreage and output for dry beans in 2001. Acres harvested for all classes totaled 105,000 acres, a 5% decline from 2000. Total production for all classes of dry beans equaled 1,785,000 cwt. in 2001. This was a 10% reduction compared to 2000.

Wheat

Colorado's winter wheat production was down significantly in 2000 due primarily to drought, above average temperatures, and freeze. Yields averaged 29.0 on 2.35 million harvested acres – the lowest since 1989. By 2001, winter wheat production in Colorado was 2.00 million acres harvested, with an average yield per acre of 33 bushels.

Vegetables

The Colorado vegetable industry continues to evolve as it faces changes in traditional markets and competition for land and water resources from a growing urban population. One of the most notable changes in the industry concerns the marketing of vegetables. Because these fundamental changes require capital, it has been difficult for some producers to make the necessary transitions. This is especially true for smaller growers. Fortunately, for the smaller-sized vegetable grower, direct marketing continues to be a bright spot in the state's overall vegetable picture. Farmers' Markets, roadside stands, and Consumer Supported Agriculture enterprises (CSAs) around the state continue to attract new customers. In addition, a number of restaurants in the Denver metro area have made a concerted effort to buy Colorado produce and form direct connections to Colorado growers. In general, the demand for fresh Colorado-grown produce is strong and the increased awareness of Colorado produce has certainly been aided by the "Colorado Proud" program developed by the Colorado Department of Agriculture.

Overall, Colorado vegetable acreage is estimated to be approximately 45,000 acres, not including potatoes. Onions are still the most widely grown vegetable crop, at over 12,000 acres. Aside from the typical scattered hailstorms, the past year was a good one for onion growers. The dry weather helped to keep onion quality high and market prices were generally fair. Second to onions in terms of acreage was sweet corn. Sweet corn was grown on roughly 8,000 acres and its worth represented about 11% of the total vegetable value for the state. Although beneficial to most vegetable crops, the warm and dry weather in 2001 had some negative effect on sweet corn. Early in the harvest season, there were problems with poor pollination and ear development on the Western Slope. Eventually, things got better and later crops had excellent quality. Carrots, grown on about 4,000 acres, represented over 18% of the total vegetable value. Carrots were primarily grown in the San Luis Valley and the northern part of the state. Other crops like cantaloupe, spinach, lettuce, and cabbage continue to be widely grown. Each of the aforementioned crops is grown on over 2,000 acres.

Aside from these traditionally produced vegetables, organic production and specialty crops are becoming increasingly important to the states' vegetable growers. As Colorado's

population becomes larger and more diverse, the demand for new crops and crops grown with alternative production practices rises. A wide variety of vegetables like peppers, kabocha squash, Asian greens, and various kinds of organic produce have exhibited great potential for Colorado's growers. Aside from the yearly concerns about weather conditions and the cost and availability of labor, the vegetable industry should continue to adapt and flourish in the state. We are likely to witness additional changes in the industry as growers learn to work cooperatively for the purpose of marketing and small-scale processing.

Potatoes

Fall potato production for Colorado fell 24% from last year's near record crop. This substantial drop in production translated directly into a better financial situation for the potato farmer. The typical Colorado potato grower is experiencing a return on crop that is up to 300% higher than in 2000. For Colorado and the United States, Mexico has become a complicated potato market. Implementation of NAFTA created an ideal opportunity for Mexico to rethink its relationship with the U.S. on many trade issues and in particular potatoes.

By July, 2001, Mexico had barred entry of table stock potatoes from seven states, Arizona, Colorado, Nebraska, New Mexico, North Dakota, Texas and Wisconsin, based on alleged interceptions of nematodes of quarantine concern. These allegations are under investigation by APHIS. At the same time, APHIS is working diligently to address Mexico's concerns by developing a comprehensive export protocol for U.S. table-stock potatoes. The protocol follows a multi-component systems approach for mitigating the risk of nematodes of quarantine concern to Mexico. It was submitted to the Director General de Sanidad Vegetal in Mexico City in August. A response to our protocol was issued by Mexico in Mid-November. Unfortunately, the response, which came in the form of specific import requirements for U.S. potatoes, was not conducive to trade. Mexico ignored our systems approach and instead elected to apply a "most restrictive measures" approach to risk mitigation, a standard that cannot be met in the commercial environment. Legitimate or not, these actions by Mexico demonstrate the effectiveness of phytosanitary issues to curtail market access.

Mexico could be a multi-million-dollar potato market for the U.S., but first they must want trade in U.S. potatoes. We cannot force it on them. And while government negotiations may prove fruitful, relationships between U.S. and Mexican potato growers could be more valuable. U.S. potatoes will move into Mexico when marketers in Mexico find situations where profits can be made. Surely there are specific markets in Mexico at particular times of the year where properly priced U.S. potatoes could turn a handsome profit. If this market is to be sustainable and equitable such opportunities must be sought out by the respective industries.

Hay

Hay continues to rank as one of Colorado's top three agricultural crops in terms of value. Although 11% more acres were harvested for hay in Colorado during 2001 compared to the previous year, the total supply is essentially the same as in 2000 because of the low beginning stocks. Basically, producers planted and harvested more acres in an effort to replenish supplies and capitalize on the strong hay market. Nationally, hay prices are running well above ($15 to $20 per ton) the 10-year seasonal average. Prices in Colorado are following that same trend. Depending on the particular area of the state, the current price for quality alfalfa hay ranges from $80 to $105 per ton. Premium and supreme quality alfalfa hay generally demands from $10 to $40 more per ton. Premium quality grass hay from the mountain areas and the western slope currently sells for as much as $140 per ton, particularly when it is sold in the strong Front Range horse markets. Hay sales to small acreage horse owners are expected to continue to increase over time. Overall demand and prices for hay in Colorado are expected to remain steady to strong into the first part of 2002 as supplies diminish during the winter-feeding period.

According to the range and pasture conditions reports, as much as 50% of the grazing land in the western region is rated as being in poor to very poor condition. This is well above the five-year average of 20%. This fact will continue to contribute to the strong demand for hay in Colorado and surrounding western states. The outlook for the 2002 hay crop appears to be good in Colorado. Following a dry and unseasonably warm fall, much of the high country received significant snowfall in late November and early December. If this trend continues, there should be adequate water for irrigation during the upcoming cropping season. Approximately 90% of the alfalfa and 72% of the other hay grown in Colorado is irrigated. The long-range climatic models do not indicate significant chances for either above or below normal precipitation during the upcoming growing season in Colorado. It should be close to a normal production year. Because supplies currently are tight, it will probably take an above-normal precipitation year before there are surplus hay supplies and prices soften.

Green Industry

The green industry is the fastest-growing segment of agriculture in Colorado. In 1993, Colorado green industries total sales were estimated to be $1.37 billion. It is estimated in the year 2001 that the overall value of the industry was about 2.0 billion. A new survey will be conducted in 2003 to get a more accurate accounting. In 1993, the green industries employed 25,552 part and full-time employees. In 2001, it was estimated to be about 36,000. There are about 1,400 member companies within the green industry. If these figures were included in total agriculture figures for Colorado, it would be over 25% of the value of all of agriculture. The green industry companies include: 1) retail florist and nurseries and lawn and garden supplies; 2) wholesale florist and nursery stock companies and suppliers; 3) landscape architects and landscape and horticultural service suppliers; 4) greenhouse, nursery and turf production and distribution; and 5) membership-only and public golf courses and related horticultural maintenance services.

In January of each year, the green industry in Colorado sponsors a weeklong expo held at the Colorado Convention Center in Denver, which attracts over 7,000 professionals with over 700 booths at a trade show. This event is viewed as the premier green industry event for the entire Rocky Mountain region. The green industries of Colorado are a co-sponsor of Plant*talk* Colorado™, which is a phone and Web-based gardening information system for the gardening public. They also co-sponsor Plant Select®, a plant introduction program for the Rocky Mountain Region and beyond. In 2001, the green industries of Colorado developed and adapted a water task force called Water Efficient Leaders in Landscape (WELL). The mission of WELL is to inform, encourage and instill the practice of sound water use across Colorado and ensure landscapes remain an essential foundation of Colorado's quality of life, economic health and public image. Landscape plants clean the air and add beauty to the environment.

Fruits

Fruit crops in Colorado were reduced in 2001 by a number of factors, including poor return bloom, spring frost, and increased pest pressure due to the preceding mild winter of 2000/2001. Apple production was around 30% of normal, due to a combination of poor return bloom, spring frost and codling moth injury to fruit. The 2000 apple set was heavy and thinning was not completed in a number of orchards in time to allow flower buds to form for the 2001 crop. National and global marketplace competition for apple sales continues to be great, but Colorado apples continue to enjoy a small, but consistent demand.

Apples continue to be Colorado's number-one fruit crop on an acreage basis, but peaches are not far behind. The 2001 peach crop was only about 67% of normal; bloom appeared to be lower for some unknown reason (possibly fall freezes before the trees had finished hardening off for winter) and spring frosts further eroded production in different orchards.

Tart cherry production was down and pear production was about average. For the second

year in a row, apricot growers had fruit to sell. Wine grape acreage and the number of wineries in Colorado continue to grow. Chardonnay, Merlot, Riesling, and Cabernet Sauvignon remain the major varieties.

Goal I: Overview and Outcomes

Objective I.A: Enhance the profitability of Colorado agriculture producers with an emphasis on increased business management skills through the development and adoption of: 1) risk management tools; and, 2) comprehensive business plans including integrated resource management.

Rural and agricultural Colorado residents face economic, social and environmental challenges that will affect the long-term sustainability and profitability of natural-resource-based economic development. Technological advances, dynamic rural-urban interfaces, water availability and quality, changing government policies, increasing regulations, influxes of large-scale commercial agricultural businesses, and an increasingly older population involved in production agriculture continue to force Coloradans to make "hard" decisions about their personal futures and the futures of their communities.

Agricultural producers now operate in a market-oriented, individual responsibility environment. Producers' management of these risks and occurrences of risk events impact families, the agricultural economy and the entire community. Successful agricultural producers understand their risks of doing business, and implement various strategies to manage those risks.

Many Colorado agricultural producers have faced substantial financial losses and erosion of equity in recent years. The markets continue to have downward pressures for many of the commodities produced in Colorado, while production expenses continue to rise at 2%-4% per year.

Rural Colorado communities face an environment of decreasing benefits from traditional agriculture and extractive natural-resource industries and increasing dependence on other economic development opportunities. The portfolio of economic opportunities for rural Colorado communities include industrial agriculture, smaller-scale niche agriculture, gaming, prisons and other governmental services, suburban growth, tourism, retiree, second home, lone-eagle and tele-commuter driven development. No economic development alternative is a panacea. Individuals and communities require timely and quality information to facilitate public and private planning and decision-making in the development of appropriate economic portfolios to meet individual and community objectives over the long term.

The issue is not so much how rural agricultural Colorado will change, but how producers and communities can adapt to an environment in which change is increasingly more commonplace. They must be flexible enough to change their business strategies as their risks change, and continually educate themselves about the impacts of a risk event and the strategies available to best manage for the event.

The number of small-and mid-sized farms and ranches is declining in Colorado (as it is across the U.S.). Agriculture and business management (ABM) economists as part of Cooperative Extension are working to stem the decline of small and medium-sized farms, to teach producers how to increase their farm efficiency and profitability, how to reduce their risk levels, and how to increase their resilience and quality-of-life levels. If current trends continue in Colorado, in 35 years the average age of farm/ranch producers will rise from 53 to 58. One of every three Colorado farmers and ranchers will leave production agriculture. One of every 10 acres in Colorado ranches and farms will be lost to agricultural production. With the phasing out of federal farm price support programs, many farm and ranch families feel greater challenges of

managing risks. ABM considers not only profit maximization but also consumer utility and satisfaction and the broader social objectives of rural communities.

Educational Strategies:

Market outlook discussions are used to provide basic information to producers, to illustrate economic thinking, and facilitate integration of market information and business decision making. Price-risk management tools, through the use of futures and options, are a primary method for acting on market information. Most producers do not use these tools because previous farm programs were direct substitutes for these tools. Further, the skills needed for use of futures and options are the same as those needed for the use of more common tools--cash-forward contracts and other forward-contracting arrangements. General information on economics and marketing is provided to producers for a number of issues. Extension educational programs present these tools through experiential learning and through development of general market-risk management skills.

Projected Outputs:

1) Develop a series of fact sheets outlining risk management tools available to producers;
2) Conduct workshops with Cooperative Extension in Wyoming, Montana, and Colorado based on a research study of producer risk-management practices in those three states;
3) Develop a database of enterprise budgets for a representative sample of Colorado producers over the five-year period, initially utilizing records integrated from the two existing farm and ranch management associations. Appropriate additional producers will be acquired from individual subscriptions or collaborations with other organizations to complete a representative sample for Colorado;
4) Present annual agricultural lender workshops to assist the community in learning the latest models for identifying wise loan investments in a changing agriculture economy.

Projected Risk Management Educational Outputs:

--Enroll 100 farm operators or operational teams to participate in the Risk and Resilience in Agriculture program.
--Recruit 30 additional operators each year through referrals from current and previous program participants after the first year of this program.
--Provide training to crop insurance agents and related users on the use of crop insurance as a risk management tool. Continue to partner and cooperate with Kansas State University and the University of Nebraska by providing one annual workshop in each of the three states.
--Provide training workshops to 50 farmers, ranchers and rural residents to underscore the elements of a properly designed estate plan.
--Provide 50 farm and ranch management association members an in-depth computerized analysis of their farm or ranch business annually and comparisons with other similar operations.
--Provide 50 farm and ranch management association members educational opportunities in production, financial, marketing, risk management, estate planning and business organization.

Projected Outcomes:

1) Increased adoption of risk management strategies by producers;
2) An increase in agriculture producers who implement an integrated resource management business plan for their entire business;
3) Integrated summaries of costs of production and analyses of Colorado agribusinesses to assist with education on management for producers, lenders, and policy makers.

Projected Risk Management Educational Outcomes:
--Agricultural or livestock producers/land managers will report enhanced profitability through development of risk management tools or use of business plans that consider integrated resource management techniques.
--Agricultural and natural resource economic programs will become well known and sought after among client groups.
--Applied economic research will become common fundable projects for the Department of Agricultural and Resource Economics and the Economics Department graduate and advanced undergraduate students.
--Value of economic analysis in facilitating decision-making will become better appreciated among client groups.
--Extension personnel will be better trained in agriculture and natural resource economics methodology and embrace a broader and more objective role for Cooperative Extension in issue agriculture and natural resource economics.

Year Three Results
Key Themes - Agricultural Profitability, Risk Management
--Of 3606 participating agricultural producer/land managers in ag and risk-management programs, 3144 (87%) reported enhanced profitability through development of risk management tools or use of business plans that considered integrated resource management techniques.

--A total of 104 participants attended 2002 Ag Lender Meetings, a 149% increase from 2001. Attendees rated the education positively giving the session (on a scale of 1-7 where 7 is high) an average rating of 6.15 for the appropriateness of the presented topics. The usefulness of the material was rated at 5.86, and attendees believed that 54% of their clientele would benefit from attendance at the training. When asked what topics were most critical to their work, the strongest response was "issues surrounding drought and water" in addition to "a greater understanding of the current Farm Bill."

--State and county Extension faculty continue to hold Northeast Colorado Dryland Cropping Systems Field Days; during 2002 they were held in six separate locations in northeast Colorado with a total attendance of approximately 400; 100% of the attendees indicated they learned something new at this program; 100% of attendees indicated that they approved tax dollars continuing to support this kind of program; 88% of the participants planned to change practices in their operation as a result of the Cooperative Extension information. The attendees reported savings of $15.75 per acre as a result of knowledge gained during the field day. Attendees at these field days manage 280,000 acres.

--A Dryland Corn School held in northeast Colorado with Agriculture Research Service personnel attracted attendees who managed a total of $70,730 acres of corn. Average savings per acre as a result of attending this program were reported at $9. As a result of this one program, there was a gross impact on the cost of inputs in that area of the state of $636,570.

--A series of workshops, field days and whole farm management study groups were attended by 4,232 participants in 2002. Of these, 75% reported enhanced profitability through the development of risk management tools or the development of business plans that considered integrated resource management techniques.

--The Winter Wheat Field Day in northeast Colorado attracted approximately 90 attendees. Evaluations showed that the most important quality of these programs were the unbiased

information presented and help with decision-making models. The most significant changes people reported they would make after this program were to utilize a new wheat variety and to engage in new herbicide control. The "knowledge gained" scores for this field day ranged from .6 to 3.6 on a 10-point scale. The greatest gain was for increased knowledge in how to use thermal weed control techniques. These techniques were piloted in Colorado by county faculty supported by Agriculture Experiment Station faculty.

--A number of county faculty worked with state faculty to enhance relationships with community planning groups and collaborations to support long-term growth and development appropriate to Colorado's agriculture. In the northwest region, county faculty initiated surveys of residents concerning their evaluation of regional water quality. Another county faculty with partners began exploring alternative crops for the Four Corners area of Colorado (including Utah, New Mexico and Nevada.) And another regional faculty member worked with county commissioners to complete a feasibility study for developing a wind farm in the county. After an initial survey, the county agreed to install two or three anemometers to measure wind speed at likely wind farm locations in order to make a more informed decision for investment.

--In 2002, increasingly, county faculty explored with state specialists appropriate alternative markets and crops for Colorado. With the pressure of the drought impacting high-water-use crop acreage, a number of alternatives have been investigated. A total of 3,254 agricultural producers or land managers attended educational sessions that encouraged alternative or niche market crops and the creation of value-added facilities for the production. Of these attendees, 219 producers reported enhanced income diversification through the production of alternative or niche market crops or the creation of new facilities. In addition, individuals reported 360 acres in canola, 100 acres in chickpeas, and 796 acres in sunflowers.

--On the eastern plains of Colorado where the drought has deeply impacted irrigated farming, a county faculty member has contracted part-time to provide leadership for the newly developed Sunflower Cooperative with Kansas State University and the University of Nebraska. On-farm trials indicated that sunflower produced high-yields with limited irrigation strategies. Four thousand pounds per acre were possible with less than full irrigation. The CSU variety trial averaged 3,300 pounds per acre during the hottest and driest growing season on record.

--The southwest corner of the state has an increasing number of small acreages and new arrivals to Colorado who are interested in niche-market successful operations. A new position for a horticulture agent in that area of the state allowed a focus on organic and other sustainable practices for smaller operations. Initial assessment identified deep bitterness and anger at the lack of service to this population in previous years. The new agent was able to make contacts, create small working groups, and co-direct a farmer's market to encourage the participation and relationship building in this group. Particularly due to a high influx of new residents in the area with a demand for specialty crops and high-quality agricultural products, the county faculty believe that supporting the development of this part of the agricultural industry is key to viability of the industry in that part of the state.

--Out of 3,254 agricultural producers or land managers who participated in alternative markets and value-added planning for agriculture, 219 reported an enhanced income diversification through the production of alternative crops or the creation of value-added facilities in their enterprise.

Integrated Agriculture Experiment Station/Cooperative Extension Programs:

In support of this goal the Integrated Resource Management (IRM) Project (#614) team is engaged in research to evaluate the most profitable, ecologically sound and socially accepted animal production systems. The results of this research are translated directly into the risk management and production consultation output through Extension state and county faculty.

The Colorado Integrated Resource Management Western Center works to improve the sustainability and profitability of livestock production systems in forage-based, natural resource environments through integrated research and education programs.

The Colorado Sheep and Wool program is structured to provide timely research-based information to adult and youth sheep producers of Colorado and surrounding states. Information provided enhances and optimizes production capabilities through all segments of the sheep industry.

Resource from CE: .3 FTE.

Linkages: CSU departments of Agricultural and Resource Economics and Human Development & Family Studies, and Extension agents especially in the northeast and southeast regions of Colorado; Montana State University, Kansas State University and University of Wyoming Extension faculty.

Source of Federal Funds: Smith-Lever

Scope of Impact: Multi-State with Montana, Kansas and Wyoming.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	2	2.5	2.5	3	3.5	1,303,439
County FTE	2	2	2	4	5	1,224,816
Total FTE	4	4.5	4.5	7	8.5	2,528,255
Budget	346,204	394,480		595,857	720,684	

Objective I.B: Enhance the diversification of income for Colorado agriculture producers by increasing the production of alternative and niche market crops: 1) crops not currently grown or in low production in Colorado; 2) increase production and value-added facilities in Colorado.

A significant faculty member who led much of the value-added alternative crops research resigned to take a research/administrative position in Montana this year. This has changed the alternative agriculture products program to a greater emphasis on fruit, organic production methods, and encouragement of dry beans and sunflowers. Colorado's fruit producers have an annual production valuation of $4 to $18 million and increasingly include growers with less than 10 acres who have limited agricultural experience, an interest in organic and/or reduced toxicity risk production methods, and need training and resources in sustainable/organic fruit production.

Most of Colorado's fruit acreage is held by growers with less than 50 acres; approximately 85% to 87% of the acreage consisted of units less than 10 acres in size in 1994 *(1994 Fruit Tree Survey, Colorado Agricultural Statistics Service)*. Many of these are relatively new growers due

to steady grower turnover. These inexperienced growers need training and resources in basic fruit production. Those within the primary fruit production area contact Colorado State University fruit research sites for help; those outside this are contacting county Extension agents for help.

Projected Outputs:
Development and introduction of successful new crops to Colorado.

Projected Outcomes:
1) Fruit growers using an integrated approach to sustainable and/or organic fruit production in Colorado will increase by 20% over the 4-year period ending 9/30/2004;
2) Agricultural producers/land managers will enhance income diversification through production of alternative or niche-market crops and/or creation of value-added facilities for production of agricultural products;
3) Fields will show an increased production of alternative crops.

Year Three Results
Key Themes – Sustainable Agriculture, Value-Added, Alternative Crops
--Agricultural producers/land managers reported enhanced income diversification through production of alternative or niche-market crops and/or creation of value-added facilities for production of agricultural products in 227 of 2,032 participants. Producers reported 32,812 acres planted in alternative crops overall, and 480 acres planted in canola.

--Increasing educational activities for small acreage owners are enthusiastically attended during 2002. Seven hundred and eighty-eight participated in workshops regarding economic opportunities appropriate for their operation. Two hundred and six of these individuals indicate they had increased their knowledge about possibilities for their enterprise. Twenty-four of 91 small acreage owners who adopted new economic activities for their acreage reported an increase in income.

Integrated Agriculture Experiment Station/Cooperative Extension Programs:
An ongoing AES research project in support of new crop development (#729) provides information directly supportive of this Extension outreach effort.
"Crops Testing" programs coordinate variety testing throughout Colorado and include winter wheat varieties, corn hybrids (dryland and irrigated grain as well as silage), sunflower hybrids, dry bean varieties, alfalfa varieties, soybean varieties, and winter canola varieties throughout eastern Colorado. Winter wheat varieties are tested in 12 eastern Colorado locations and there are 11 dryland and irrigated grain corn test locations in eastern Colorado.
The Alfalfa Variety Testing and Extension Education for Colorado includes five different extension and research groups and focuses on Wiggins in the northeast, Yellow Jacket in the southwest, Rocky Ford in the Arkansas Valley, the San Luis Valley, and Fruita on the western slope.
Resources from CE: .3 FTE.

Linkages: CSU departments of Soil and Crop Sciences, Agriculture and Resource Economics and the Agricultural Experiment Station; Colorado Department of Agriculture Marketing Division, Colorado Department of Local Affairs, Mesa County Commissioners, Fruita Consumers Coop Board of Directors, Mesa County Economic Development, and Fruita City Council.

Source of Federal Funds: Smith-Lever, Hatch

Scope of Impact: State Specific

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	2	1	2	4	5	1,737,918
County FTE	2	1.5	3	3.5	4	1,148,265
Total FTE	4	2.5	5	7.5	9	2,886,183
Budget	346,206	118,491		654,133	788,959	

Objective I.C: Enhance Colorado producers' competitiveness through the use of appropriate new GPS/GIS and precision agriculture technologies.

Training of competent professionals to transfer precision technology to the user and farming community will be accomplished. The use of management zone systems to better manage the inherent variability of farm fields should reduce environmentally sensitive agricultural inputs, maintain or increase grain production, increase net profit, and enhance efficiency of agricultural inputs.

Irrigation methods and practices used in Colorado vary from wild flooding to sophisticated computer controlled systems. Although Colorado's climate is semi-arid (average annual precipitation ranges between 7 and 18 inches), agricultural water supplies are usually abundant along the Front Range and on most of the Western Slope, including the San Luis Valley. The Eastern Slope can be divided into three major areas as far as water supplies are concerned. The valley of the South Platte River on the northeastern plains, the valley of the Arkansas River on the southeastern plains, and the third area is along the Nebraska and Kansas borders overlaying the Ogallala Aquifer. The first two usually have adequate water supplies during the early part of the season. Water supplies later in the irrigation season depend on river flows. The areas that pump water from the Ogallala Aquifer have consistent water supplies, but they are expensive due to high-energy costs. Irrigation is a must in several areas of Colorado, and in other areas it can increase yields significantly.

This situation of semi-arid climate, abundant water supplies and different climatic conditions creates a wide spectrum of irrigation practices in Colorado. The irrigation methods and practices used in different areas are a direct result of this situation. Water use efficiencies have a strong correlation with the cost and scarcity of water. The acceptance of new irrigation technology that can increase water use efficiencies is strongly correlated to the scarcity and cost of water.

The Western Great Plains region is among the leaders in the nation's crop production. The average corn grain yield of this region usually exceeds the national average. However, such high grain yield production comes at a cost of applying significant quantities of various agricultural inputs, i.e. irrigation, nutrients, and pesticides. Corn, a major crop in this region, is grown in rotation with high value crops such as onions and sugarbeets. These crops require high levels of inputs. In traditional farming systems, producers attempt to apply these inputs at a uniform rate across a given field. However, due to inherent spatial variability in the field, not all areas require the same levels of input. Because inputs are inexpensive relative to the value of the crop produced, farmers will logically apply inputs such that a fairly high proportion of the field receives an adequate level of the input. This results in various areas of the field receiving greater input than necessary. The significance is two-fold: additional inputs are purchased at a cost that

may be unnecessary and excess input is especially prone to offsite degradation of the environment through runoff or leaching—a serious groundwater issue in this region. Intuition and on-going research data suggests that use precision agricultural practices and site-specific management of crop production inputs to match the variability that occurs in the field will solve many of the problems cited above.

The goal of this program is to enhance the farming communities' capacity to integrate site specific technologies into their farming systems. Preliminary data collection, analysis, and technology transfer initiatives allow site specific yield predictions based on the interaction of natural resources on different farmers' fields. Remote sensing technology for in-season variable rate N management is being developed. Continuation of this initiative with additional crops, additional sites and farmers, under additional irrigated systems, will greatly enhance the value of the work and facilitate adoption of precision technologies in agriculture that are economic, beneficial, and environmentally responsible.

Development and demonstration of management zones for variable rate nutrient, insecticide, miteicide, herbicide, fungicide, and irrigation water management will be a valuable tool for decision support systems. Economic and environmental cost-benefit analysis of precision farming will provide greater incentive to farmers for adoption of precision technologies into their operation. Assessment of user needs and adoption of precision farming technology will be measured through surveys and documented with on-site data. Training of competent professionals to transfer precision technology to the user and farming community will be accomplished. The use of management zone systems to better manage the inherent variability of farm fields should reduce environmentally sensitive agricultural inputs, maintain or increase grain production, increase net profit, and enhance efficiency of agricultural inputs.

Projected Outcome:
Increased profit through the adoption of appropriate GIS and GPS technologies in production areas of the state where economies of scale make these technologies feasible.

Year Three Results
Key Themes - GIS/GPS, Agricultural Competitiveness, Precision Agriculture
--Ongoing work with the Wiggins research site in eastern Colorado is being translated into a variety of educational workshops for producers. Four hands-on workshops in computer laboratories with simulation decision models were held in 2002. Each workshop lasted two days with outstanding response from the attendees. A total of 92,210 acres were managed by attendees at these workshops. There were an equal number of acres managed by farmers as by consultants. The respondents indicated that the information was extremely valuable and would be implemented in their decision models for their own enterprises. An additional 15 presentations on decisions models utilizing precision agriculture were held throughout Colorado during 2002.

Integrated Agriculture Experiment Station/Cooperative Extension Programs:

Programs on *Information Technology for Colorado Agriculture and Natural Resource Management* provide education and support in the area of information technologies applied to Colorado agricultural- and natural-resource management situations. This includes the use of global positioning systems (GPS), Global Information Systems (GIS) and precision farming systems (variable rate application).

The *Precision Agriculture* research and extension program studies and develops management strategies using Global Positioning System and Geographical Information Systems that are compatible with farming practices in the irrigated western Great Plains region of Colorado. The goal is to increase farm profitability and enhance environmental protection. One strategy is to define zones within a given field and minimize inputs while maximizing outputs

based on soil characteristics. This "management zone" approach may prove more economical and sustainable, lowering the potential for environmental degradation. Different methods of defining management zones are compared. The project uses three fields in eastern Colorado to provide producer training in the design and implementation of management zones. Bulletins, field days, newsletters, meetings, the Internet, and other methods will be used to facilitate technology transfer.

Linkages: CSU departments of Chemical and Bioresource Engineering, Agriculture and Resource Economics, Soil and Crop Sciences, Bioagricultural Sciences and Pest Management; state, regional, and county faculty; Agricultural Experiment Station, Natural Resources Conservation Service, private seed companies, equipment companies and other agribusiness interests; Agricultural Research Service.

Source of Federal Funds: Smith-Lever, Hatch

Scope of Impact: State Specific

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	3	1.5	4	4.5	5	1,931,020
County FTE	2	3	3	3.5	4	1,148,265
Total FTE	5	4.5	7	8	9	3,079,285
Budget	442,755	208,968	615,858	702,409	788,959	

GOAL II: A safe and secure food and fiber system.

Issue: *Coloradans are particularly concerned about the safety and purity of their food supply. This is especially true of those persons who have immigrated to Colorado for the healthy natural environment and active lifestyle. An increasing number of Coloradans live in an urban environment and their views dominate the state legislature and many state policies. Coloradans are critical of the agriculture community whenever food safety alarms or food-borne illnesses become a matter of public attention. Specific concerns surround pesticide residues, microbial safety, and natural toxins. A strong environmental group in Colorado is critical of new biotechnology methods and preservation/packaging methods.*

While 3(d) funding funds a number of specific food safety initiatives, food safety is an important component of our ongoing base programs. In 1996, 608 cases of food-borne illnesses were reported to the Colorado Department of Public Health and Environment (approximately 20 cases per 100,000 people). It is estimated that the cost in health care and loss of work productivity represents $75-330 million dollars annually in Colorado.

Colorado participated in the 1995 and 1996 regional Behavioral Risk Factor Surveillance System on food handling behaviors and consumption of foods. Half of the survey respondents (50.2%) reported eating undercooked eggs; by comparison 62% of Coloradans reported eating undercooked eggs. Coloradans also report consuming more pink hamburger meat (28.8%) than the other states surveyed (19.7%). Approximately, 23% of the Colorado respondents reported not washing their hands after handling raw meat or chicken, and 28% of Coloradans responded that they did not wash cutting surfaces with soap after using it with raw meat or chicken. Both of these percentages were higher than the averages in other states.

Colorado Situation Influencing Goal II

The population of Colorado in 1999 was 4,056,133 persons and has been estimated to be growing by between 2.2% and 2.5% yearly. The number of Coloradans living below the federally designated poverty line increased by almost a third from 1980 to a high of 392,938 in 1996. This was substantially above the 14.0% increase for the total population nationwide. The poverty rate for Colorado now stands at an estimated 11.7% compared with 10.1% in 1980.

Poverty rates vary by age and living arrangements. Children continued to represent a large share of the poor population (39%) in the U.S. even though they were only about 26% of the total population. Female single parent families have especially high poverty rates. According to the Bureau of Census' Consumer Expenditure Study, 81% of female single parent families receive public assistance, mostly in the form of food stamps. In fact, children under age six living in families with a female householder, no husband present, had a poverty rate (54.8%) that was more than five times the rate for their counterparts in married-couple families (10.1%). In Colorado, while the percent of children in poverty has improved slightly over the past ten years, the 1996 percentage was 14.2. The proportion of families below poverty also increased from 1980 to 1998 from 7.4% to 10.0%.

One of the many consequences of poverty is the lack of money for food. Food resource management is an important tool to learn in order to stretch food dollars, so that families not only have enough food to last until the next paycheck, but make healthful food choices too. Colorado Adult EFNEP will improve the nutritional well being of low income Coloradans and increase their ability to manage food resources through informational and educational opportunities that will help them develop new skills and learn new behaviors toward attaining self-sufficiency.

Food Safety and Quality: Safe Food-Handling Practices

Foodborne illness in the United States is a major economic burden and cause of human suffering and death. While foodborne illnesses are often temporary, they can result in more serious illnesses requiring hospitalization, or in long-term disability and death. The economic and social consequences of foodborne disease in relation to health-care costs and loss of work productivity are large. Hospitalizations due to foodborne illnesses are estimated to cost over $3 billion each year in the United States and over $43 million in Colorado. The yearly cost of lost productivity is estimated at between $20 and $40 billion in the U.S. and $292 to $584 million in Colorado.

The Centers for Disease Control and Prevention estimates that one in four Americans become infected with some form of foodborne illness each year, and that annually foodborne contaminants cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in the United States. These estimates make the assumption that because most cases of foodborne illness are mild and/or short-lived and are difficult to trace back to a particular food, only one to five percent of actual cases are reported each year and even fewer are investigated.

In 1998, 38 outbreaks of foodborne illness potentially affecting 956 people were investigated in Colorado. This yielded an approximate foodborne illness rate of 23.6 cases / 100,000 people. For states involved in FoodNet (Foodborne Diseases Active Surveillance Network), a program which actively assesses reported cases of foodborne illness, the preliminary foodborne illness incidence rate for 1999 was 40.7 cases /100,000 people. Clearly, an active surveillance results in more cases being reported and investigated.

The 1999 FoodNet report summarized data from seven states (California, Connecticut, Georgia, Minnesota, Oregon, New York, and Maryland). Colorado joined the network in January 2000 and began contributing surveillance data in 2001. The Colorado site will include selected counties in the Denver metropolitan area, representing 48% of the state's population.

FoodNet data suggest a 21% decline in the foodborne incidence rate between 1996 and 1999 in the five original sites, 51.2 cases/100,000 in 1996 vs. 40.7cases/100,000 in 1999. Although FoodNet is suggesting a trend of decreased incidence of foodborne illness cases, public health officials continue to be concerned about foodborne illness. Many feel that certain issues and trends may make foodborne illness more of a problem in years to come. According to the *Healthy People 2010 Initiative*, emerging pathogens, improper food preparation, storage, and distribution practices, insufficient training of retail employees, an increasingly global food supply and an increase in the number of people at risk because of aging and compromised capacity to fight these diseases all may play an important role in the foodborne illness trends we will see in the future.

Results from the 1995 & 1996 Behavioral Risk Factor Surveillance Systems (BRFSS) suggest that Coloradans exhibit risky food handling behaviors as well as consumption of high-risk foods. Colorado was one of eight states that participated in the 1995 and 1996 BRFSS. Consumers were asked a set of questions to identify food handling, preparation, and consumption behaviors that have been associated with foodborne diseases in adults. Half of survey respondents (50.2%) reported eating undercooked eggs; by comparison, 62% of Colorado respondents reported eating undercooked eggs. It also appears that more Coloradans reported consuming pink hamburgers (28.8%) than the other states surveyed (19.7%). Overall, the prevalence of reported consumption of pink hamburger decreased with age, increased with education and increased with income.

Coloradans also could benefit from more education on safe food handling and preparation practices as shown by results in the 1995 & 1996 BRFSS. Approximately 23% of Coloradans reported not washing their hands with soap after handling raw meat or chicken, compared to

18.6% of the total participants from all states surveyed. The practice of not washing cutting surfaces with soap after using it for cutting raw meat or chicken was reported by 19.5% overall and by 28.2% of Coloradans in the survey. All high-risk food handling, preparation, and consumption behaviors were more prevalent in men than in women. This may help explain the recent FoodNet finding that "overall, males were more likely than females to be infected with every pathogen except Cyclospora and Yersinia". Interventions are needed to reduce the prevalence of these risky behaviors.

The hazard of foodborne illness originating from mishandled food is an issue in any location where food is available to consumers. This risk is especially important when hazardous food is served in group settings to older persons, young children, or individuals with compromised immune systems. Protecting high risk individuals from foodborne disease is expected to take on increased significance as more children are kept in child-care homes and centers and a greater segment of the population becomes immuno-compromised through aging, medical intervention, and illness.

Food poisoning is usually a preventable disease. In most instances it can be avoided simply by applying well established hygienic standards in the production, preparation, holding, and serving of food. If safer food is our goal, food service personnel need to be trained in proper food handling practices. According to Bryan, “a few operations are vital to food safety.” By using a Hazard Analysis/Critical Control Points system and ensuring that operations are carried out in a safe manner, many food safety hazards could be prevented, controlled, or alleviated with a high degree of assurance.

Seven food safety objectives are identified in the *Healthy People 2010 Initiative* with the goal to reduce foodborne illnesses. Clearly two of the seven objectives could be impacted by food safety education provided by Extension agents in Colorado.

Five food safety risk factors related to employee behaviors and preparation practices have been identified by CDC as contributing to foodborne illness--including improper holding temperatures, inadequate cooking, contaminated equipment, food from an unsafe source, and poor personal hygiene. For each year from 1988 through 1992, the most commonly reported food preparation practice that contributed to foodborne disease concerned improper holding temperature; the second concerned poor personal hygiene of food handlers.

Extension agents currently provide food safety education to the audiences listed in the *Healthy People 2010* 10-5 and 10-6 objectives. Extension agents educate consumers and work collaboratively with environmental health agencies and retail establishments to educate the food handler in retail food establishments as well as food handlers in institutional establishments. Colorado, as well as the nation, is experiencing a trend of high rates of employee turnover in the retail food industry. The retail food industry has the additional challenges of language and literacy barriers and non-universal systems for training and certifying workers in the area of food safety. The task to provide food safety training to this dynamic audience is great and not easily handled by any one group. Hence the opportunity for collaboration in providing food safety training is not only possible but practical.

Innovative strategies designed to educate consumers and food handlers about food safety issues and about proper food handling techniques are needed. Incorporating the following six components into any food safety educational strategy will help to assure success:

1. *Information sharing:* work collaboratively with many agencies to encourage joint initiatives and information sharing.

2. *Consistent messages*: agencies need to coordinate message development and strive for consistency whenever possible.

3. *Research-based*: base the education efforts on scientific findings.

4. *Target high-risk consumers*: focus education efforts on those consumers who are at the highest risk.

5. *Work with the media*: work with the media to ensure that the media has accurate information and encourage media representatives to help convey Extension food safety education messages.

6. *Educate all audiences*: direct education efforts to all appropriate audiences, including food handlers, health professionals, state and local officials, consumers and childcare workers.

Goal II Overview and Outcomes

Objective II. A: Promote food safety across the food chain from production through consumption.

Projected Outputs:
1) Develop a rapid response and information service including the safe food web site;
2) Develop a food safety list serve; and
3) Develop a quarterly food safety newsletter.

Projected Outcome:
80% of Extension program participants will show increased knowledge of recommended food handling practices through pre/post surveys.

Year Three Results
Key Themes - Food Safety, Food Handling, Foodborne Illness, e. coli Outbreak
--Of 1,103 participants, 662 adopted or strengthened at least one new behavior as a result of the program to improve their understanding of food-related risks and the scientific bases for risk management decisions

--Participants increased knowledge about foodborne illnesses and reduced foodborne illness risks by adopting safe food production, handling, preparation and consumption practices through individual consultations:

Total number of individual contacts: 12,408
Number who increased knowledge as a result of the contact: 10,523
Number who plan to adopt the recommendation as a result of the contact: 10,032
Number who actually adopted the recommendation as a result of the contact: 4,180

--Participants reduced foodborne illness risks by adopting safe food production, handling, preparation and consumption practices through program activities:

Total number of program participants: 486,992
Participant type(s):
- Mixed Group: 183,128
- Consumers: 99,308
- Extension staff: 1,936
- Food handlers: 6,776
- Food managers: 2,156
- Food producers: 5,500

FSNEP clientele: 60,720
Professionals: 1,452
Volunteers: 7,436
Youth: 116,292

Number who increased knowledge as a result of the program: 266,904
Number who plan to adopt or strengthen at least one new behavior as a result of the program: 261,888
Number who actually adopted or strengthened one new behavior as a result of the program: 90,024
Total program hours (preparation & delivery): 52,888
Total hours contributed by volunteers: 120,956

--Participants improved their understanding of food-related risks and the scientific bases for risk management decisions through individual consultations:

Total number of individual contacts: 23,016
Number who increased knowledge as a result of the contact: 21,980
Number who plan to adopt the recommendation as a result of the contact: 280
Number who actually adopted the recommendation as a result of the contact: 224

--Participants improved their understanding of food-related risks and the scientific bases for risk management decisions through program activities:

Total number of program participants: 6,132
Participant type(s):

Mixed Group: 1,260
Consumers: 28
EFNEP clientele: 28
Extension staff: 140
Food handlers: 1,792
Food managers: 308
Food producers: 308
FSNEP clientele: 28
Producers: 224
Professionals: 112
Trainers: 168
Volunteers: 112
Youth: 28

Number who increased knowledge as a result of the program: 5,824
Number who plan to adopt or strengthen at least one new behavior as a result of the program: 2,632
Number who actually adopted or strengthened one new behavior as a result of the program: 1,260
Total program hours (preparation & delivery): 2,492
Total hours contributed by volunteers: 280

--Food safety and handling questions continue to be one of the most frequently queried areas for phone calls, office visits, and inquiries to Answerlink. In a pilot study of individual phone consultations conducted by county nutrition faculty 3,944 of 5,207 contacts or approximately 80% were related to food safety and food preservation; 50% of those who responded to a follow-

up postcard survey indicated they had improved their knowledge in this area.

--Following a suspected link between two cases of e. coli O157:H7 infection in children with the consumption of watermelon with unwashed rinds at a Fort Collins Farmers' Market, the Larimer County Department of Health & Environment immediately required vendors to stop providing free food samples. Cooperative Extension staff in collaboration with county health department officials provided training for more than 200 farmers, market managers, vendors and health department officials; 90% increased their knowledge of good agricultural practices and safe produce sampling guidelines; 83% said they planned to make changes in food-handling procedures, including installation of hand-washing stations, sanitizing knives and cutting boards, and pre-washing produce prior to market. A 6-month follow-up with growers and vendors indicated that most made the recommended changes or chose not to offer samples at farmers' markets.

--In Larimer County, CO, the local health department has estimated health care costs per hospitalized foodborne illness case at between $7,000 and $23,000. Last year, 33 Master Food Preservers in Larimer County fielded 861 consumer questions related to food safety and food preservation; with a conservative estimate, these volunteers could have saved more than $600,000 in health care costs by preventing just 10% of potential foodborne illnesses.

--Last year 81 Colorado Master Food Preservers volunteered 946 hours in an effort to provide educational information and enhance food safety among consumers. At an estimated value of volunteer time of $15.39 per hour, that is an investment of $14,559 in the state to prevent foodborne illness.

Linkages: CSU departments of Food Science & Human Nutrition, Animal Sciences, Epidemiology and Environmental Health; state Extension specialists and county Extension faculty, Colorado Nutrition Network, Extension Nutrition Programs; Colorado Department of Public Health and Environment, Colorado Department of Agriculture, Food and Drug Administration-Denver district, Colorado Department of Education, retail food establishments, and Colorado county school districts.

Source of Federal Funds: Smith Lever, 3-D and Hatch.

Scope of Impact: Colorado

Integrated Cooperative Extension/Agricultural Experiment Station Programs: Researchers in the departments of Food Science and Human Nutrition, and Animal Sciences have been working together over the last three years to identify safe and effective ways to kill *e.coli* and other illness-causing bacteria in dried meats. During 2002, final research studies supported the publication of guide sheets and research papers specifying temperatures and techniques for a safe consumer product.

Objective II.B: Provide certification training for food handlers.

Extension agents currently provide food safety education to the audiences listed in the *Healthy People 2010* objectives. Extension agents work collaboratively with environmental health agencies and retail establishments to educate food handlers in retail food establishments as

well as food handlers in institutional establishments. Colorado is experiencing a trend of high rates of employee turnover in the retail food industry. The retail food industry has the additional challenges of language and literacy barriers and non-universal systems for training and certifying works in the area of food safety. The task to provide food safety training to this dynamic audience is great and not easily handled by any one group. Hence the opportunity for collaboration in providing food safety training is not only possible but practical. Key food safety practices are based on the four "Fight BAC!" campaign messages. They are: *clean: w*ash hands and surface often; *separate:* don't cross-contaminate; *cook:* cook to proper temperatures; and *chill:* refrigerate promptly.

Projected Outputs:
Food safety certification and train-the-trainers projects deliver food safety education programs to food handlers.

Projected Outcomes:
70% of attendees at Extension sponsored food certification programs will report plans to adopt recommended food handling practices and increased knowledge of risks in food safety and health.

Year Three Results
Key Themes - Food Safety, Food Handling, Foodborne Illness
--Colorado State University Cooperative Extension offers food safety education through ServSafe™, a certification program developed by the National Restaurant Association. ServSafe training teams are typically responsible for a class of 30 food handlers, who in turn can be responsible for serving or preparing as many as 7,000 to 10,000 meals per day in restaurants & food establishments, nursing homes & senior centers, day care homes, jails & prisons and catering businesses. Eight training teams who serve twenty Colorado counties have trained 1,157 restaurant managers/owners and food handlers from nursing homes, grocery stores, jails and prisons, catering businesses, service clubs, and senior meal sites. Documented changes in food safety behavior showed 84% to 95% planned to adopt at least one or more recommended food handling practices, and knowledge increased 30% from pre- to post-test surveys.

--In seven counties in northeast Colorado, ServSafe trainings were completed by 126 individuals during the year 2002. Participants reported they serve an average of 33,851 individuals daily in their establishments. Pre-post tests showed a gain from mean of 70.75 to 90.85 after the class training. In response to question regarding what food safety practice they would institute as a result of the class, 71% reported they would maintain correct temperatures for foods, 38% indicated they would improve the rate of hand-washing and personal hygiene, and 27% reported they would use correct cleaning and sanitizing procedures for equipment. As a result of the training, 26 of the 85 participants indicated they would teach an additional 500 employees the information they gained from this training.

--In Eagle County an increasing number of meals are served by establishments providing support to the tourism industry. In 2002, 16 individuals participated in a ServSafe class, with 12 of the 16 receiving national ServSafe certificates. These individuals served 13,475 meals per day during the height of the ski season in Eagle County.

--Of 2,374 participants in safe food handling classes, 1,500 adopted or strengthened a food safety behavior as a result of the program.

--A three-state collaborative effort among Cooperative Extension and state departments of health and agriculture in Colorado, Wyoming and Montana was initiated to plan and evaluate food safety strategies. Using focus groups in each state, managers and front-line restaurant employees provided ideas for controlling food safety hazards in retail food operations, from personal hygiene to food-holding temperature recommendations. Information gathered is being used to develop more effective education to promote safe food-handling practices among restaurant employees and regulatory planning efforts.

--A survey of restaurant managers in Colorado, Wyoming and Montana found a strong preference for hiring workers with training in safe food handling procedures; the majority of managers also indicated a willingness to pay for training, and reward trained employees with higher salaries, increased wages and promotions

Linkages: CSU departments of Food Science and Human Nutrition and Animal Sciences; state specialists and county faculty; Extension Nutrition Programs; Colorado Department of Health and Environment, local health departments, congregate meal site managers, retail food industry partners.

Source of Federal Funds: Smith-Lever, USDA Nutrition Services

Scope of Impact: State Specific and Multi-State: Colorado, Wyoming and Montana

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	1	1	1	2	2	724,133
County FTE	1	8	2	3	3	842,061
Total FTE	2	9	3	5	5	1,566,194
Budget	173,102	389,170		422,755	422,755	

Objective II.C: Enhance red meat safety.

With the large numbers of market livestock, in addition to two of the largest beef and lamb slaughter facilities in the U.S., the quality, safety and demand for red meat is essential for the economic sustainability and profitability of the Colorado livestock industry. Because of major *Escherichia coli* O157:H7 outbreaks that resulted in loss of human life in the U.S. during January of 1993, in Japan during the summer of 1996 and again in the U.S. in 1997, significant public attention around the world is now focused on the incidence of food-borne illness, especially when it results from contaminated red meat products that escape detection by traditional food safety inspection methods. Outbreaks of foodborne illness, in addition to threatening public health and endangering lives, dramatically affect market growth and sales of U.S. red meat products worldwide. Concern for foodborne illness prompted substantial reorganization of the USDA Food Safety Inspection Service (FSIS) between 1993 and 1997, and sweeping changes are currently underway as companies implement the 1996 FSIS/ USDA Pathogen Reduction/HACCP

Final Rule ("Mega-Reg") that will replace antiquated forms of meat inspection.

The Meat Science Extension program will target its efforts towards interacting with producers and youth addressing the production of high quality, safe meat products. Scientific and technological advances in the industry will be disseminated via community presentations, workshops, short-courses, personal interaction, and refereed publications. Additionally, the youth sector will be targeted through 4-H market livestock carcass evaluation and 4-H/FFA career identification and meats judging events. In addition to these activities, the Meat Science Extension program will continue to provide support and information to the growing and developing Colorado Beef Quality Assurance and Meat Quality Assurance programs, through involvement with the Colorado Beef Quality Assurance Council and county level Meat Quality Assurance programs. These efforts will facilitate the production of high quality and safe meat products improving consumer satisfaction and stimulating meat product demand.

Projected Outputs:
Provide training programs on verification criteria and consulting to implement mandatory HACCP systems in meat packing and processing plants.

Projected Outcomes:
1) Increased number of Colorado red meat producers, packers and processors who implement preventative systems to improve meat safety and quality.
2) Reduced incidence of food-borne illness due to pathogen transmission from red meat products.
3) Increased numbers of livestock producers receiving BQA/MQA certification training.
4) Increased numbers of animals (head) being produced under BQA/MQA guidelines.
5) Increased red meat demand.

Year Three Results
Key Themes - Food Handling, Food Safety

Source of Federal Funds: Smith-Lever

Scope of Impact: State Specific

Integrated Cooperative Extension/Agricultural Experiment Station Programs:

Red meat quality and safety is enhanced through an ongoing AES funded project (#214) that provides research and technology transfer to producers and Extension educators.

Resources from CE: .4 FTE.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	1	1	1.5	2	2	724,133
County FTE	2	8	3	3	4	1,071,714
Total FTE	3	9	4.5	5	6	1,796,147
Budget	249,653	389,170	374,480	427,755	499,306	

Objective II.D: Enhance the health of Coloradans by increasing awareness and skills to manage animal diseases.

The health and well being of animals is dependent upon owner knowledge and veterinary care that varies greatly throughout the state and the surrounding states. There are 29,500 farms in Colorado on 32.5 millions acres of land. The income from Colorado agriculture production amounts to $4.4 billion of which 69% is attributed to livestock. In addition to the above farms are approximately 10,000 small acreage (less than 35 acres) producers, the majority of which maintain animals. The major livestock and dairy producers are extremely keen and knowledgeable on animal health and well being. The majority small acreage producers are interested in the health and well being of their animals but some lack the experience and knowledge necessary to provide a healthy, comfortable environment for the animals under their care.

Projected Outputs:
l) Consultations by Extension veterinarians and researchers;
2) Educational fact sheets;
3) Electronic news alerts;
4) Training teleconferences and meetings to educate key citizens.

Projected Outcomes*:*
1) Increased awareness and increased number of emergency preparedness plans for animal disease threats;
2) Enhanced skill/consultation among Extension personnel in handling individual consumer & producer questions on animal health;
3) Increased knowledge among animal owners, veterinarians and veterinary students in the areas of animal care to promote health and well-being;
4) Increased knowledge among small acreage owners and producers about animal health and well-being;
5) Reduced animal disease.

Year Three Results

Key Themes – Foot & /Mouth Disease

The recent outbreak of foot and mouth disease in Europe sparked a thirst for information in Americans, including animal producers. The Colorado Department of Agriculture and Cooperative Extension offices were flooded with calls from concerned citizens. Misinformation, a lack of resources and the fact that the disease has not been found in the United States for decades made it difficult to respond with clear messages. Calling upon our mutual goal to serve Colorado residents, Cooperative Extension and the Colorado Department of Agriculture quickly responded to the risk of foot and mouth disease spreading to America and Colorado during the recent European outbreak by designing information, a system to disburse it, and protocol to prevent foot and mouth disease in Colorado and contain its spread if diagnosed here.

Colorado State Cooperative Extension and the Colorado Department of Agriculture formed a core response team of experts including veterinarians, communicators and Cooperative Extension specialists and agents. This team partnered with officials from the U.S. Department of Agriculture; federal, state and local emergency management response; law enforcement; and government officials. The team designed prevention strategies and information for animal

producers and the general public and shared the information through train-the-trainer workshops, meetings with other agencies, fact sheets and a Web site. The team educated the agencies above and also military officials; private practice veterinarians; animal owners including ranchers; food production and agriculture organizations; food safety experts and elected officials. The team held five trainings around the state for other officials who learned about the disease, how it is spread, Colorado's official response protocol, mental health and community considerations, and how to talk to the public and media about foot and mouth disease. Up-to-date information was presented at each training. The trainings formed a network of professionals who then educated others in their communities about foot and mouth disease, using resources developed by the team.

Educational Outputs:
--In addition to the training, the team developed a Web site and a notebook containing up-to-date information. Those resources included general information about foot and mouth disease and photographs of the symptoms; Colorado's response plan; the nation's response plan; fact sheets for producers, travelers, children and the general public; updates on the outbreak in the United Kingdom; and human health risk information. The most-used information on the Web site included tips for travelers, information about food safety, and the list of links to additional resources.

--An educational poster was developed and distributed to sale barns, feed stores, large animal veterinarian offices and other places frequented by animal producers.

--During the height of the UK outbreak in April and May, the Colorado State Cooperative Extension foot and mouth Web site received several thousand hits. The Web site was promoted primarily to workshop participants as an additional resource for materials and to share with others. It also served as a resource to the media.

Educational Outcomes:
--Participants included 84 Cooperative Extension professionals (agriculture, community and food safety); 23 county commissioners; 23 county or city government employees; 11 representatives of advocacy or professional groups; 3 agricultural business representatives; 6 private-practice veterinarians; and 47 unspecified professionals. Almost three-quarters of the participants reported that the information on Colorado's response protocol and indemnity to animal owners was all new or mostly new to them.

--Sixty percent of the participants reported that they gained new understanding of the Office of Emergency Management and the resources it can provide. More than half of the participants (54%) learned all new information about the disease and how it spreads, and about the same number (48%) learned new preventative measures. An additional 56% learned new information about how the disease affects species differently, and how those differences contribute to the spread and maintenance of the virus. About half of the participants stated that new information was presented in areas including biosecurity; wildlife implications; community impacts; disease transmission; mental health and emotional recovery; and roles with the media. The USDA veterinary service role was reported as new information to 44% of the participants, the lowest percentage

Continuing Outcomes:
--In May 2002, the Colorado Senate passed a resolution commending the Colorado Department of Agriculture for its efforts with foot-and-mouth disease and bovine spongiform encephalopathy (BSE). The Senate resolution recognized the Department and the USDA Animal and Plant Health Inspection Service, Veterinary Services, for adopting the Colorado foot-and-mouth prevention and response protocol.

--The Department of Agriculture, Cooperative Extension, the Colorado Office of Emergency Management, local government, the military and additional agencies are finalizing a response plan that outlines the roles of each government agency. The groups recently completed a response plan to address possible cases of foot and mouth disease before a diagnosis is confirmed. A series of regional practice response exercises are planned this winter and next spring.

Key Themes: Livestock Best Management Practices
--Of 12,560 livestock producers/managers participating in educational opportunities, 10,711 reported an increased knowledge about and adoption of best management or production practices for livestock operations.

--Of 9,174 livestock producers/managers reporting, 4,130 said they would adopt research-based best management or production practices for livestock operations.

Linkages: CSU departments of Clinical Sciences, Epidemiology and Environmental Health, Pathology, Microbiology, Animal Sciences, Food Science and Human Nutrition, and Fishery and Wildlife Biology; Veterinary Medicine Diagnostic Laboratory, and county and regional faculty; Colorado Department of Agriculture, Colorado Division of Wildlife, and Colorado Department of Health and Environment.

Source of Federal Funds: Smith-Lever

Scope of Impact: State Specific

Education and Outreach: This program will be integrated into the state Plan of Work and regional Plans of Work in the broad programming area of Improving Nutrition, Food Safety, and Health, and in the area of Sustaining Agriculture and the Environment. In 1999-2000, the Colorado Department of Agriculture funded .5 FTE of an Extension veterinarian to work in the programming area. In 2000-2001, the State Veterinarians' Office, the CSU Veterinary Teaching Hospital, and CSU Extension are developing a statewide, integrated staffing plan.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	1.5	2	2.5	3	3.5	1,206,888
County FTE	2	2	3	3	4	1,071,714
Total FTE	3.5	4	5.5	6	7.5	2,278,602
Budget	297,929	346,204	471,031	519,306	644,133	

GOAL III: A Healthy Well-Nourished Population

Issue: *Nutrition plays a vital role in overall health. In fact, research has found that diet is associated with the leading causes of death, many of which are preventable--heart disease, diabetes, obesity, and several types of cancer. Cardiovascular disease and cancer together account for almost two-thirds of all deaths in the United States. Despite the importance of diet, however, Americans fail to achieve dietary recommendations laid out by the Dietary Guidelines and the Food Guide Pyramid, dietary practices which lower the risk of disease. According to the 1994-1996 Continuing Survey of Intakes of Individuals, the average number of servings from the fruit, dairy, and meat groups were below minimum serving numbers recommended in the Pyramid and servings from the grain and vegetable groups were near the bottom of recommended ranges. Calories from fats and sugars exceeded Pyramid recommendations. In Colorado, the statistics reflect these national trends. It has been estimated that 74.0% of adults and 67.7% of high school students in Colorado reported eating fewer than five servings of fruits and vegetables per day.*

Other dietary trends show that:

--Adult females failed to meet the Recommended Dietary Allowances (RDA) for five nutrients--calcium, vitamin E, vitamin B-6, magnesium, and zinc.

--Adult males fell short of the RDA for vitamin E, magnesium, and zinc.

--Adults' low intakes of fiber, magnesium, and zinc could be improved by increasing intakes of whole grains, fruits, dark green vegetables, legumes, and lean meats and meat alternates as recommended by the Food Guide Pyramid.

--Fat accounted for 33% of calories in the American diet. Despite this decrease, only about one-third of adults met the 30% or less of calories from fat recommended by nutrition experts.

--Since 1989-91, amounts of soft drinks consumed by both women and men have surpassed their intakes of milk.

--Americans consume an average of 20 teaspoons of added sugars a day--accounting for 16% of calories.

--Sodium intake should be limited to no more than 2,400 milligrams per day. The average intakes from foods alone are over 4,000 milligrams for men and almost 3,000 milligrams for women.

--About 57% of Americans ate away from home on any given day. Foods eaten away from home accounted for more than 25% of total calorie and fat intakes.

It is likely that these trends will continue, further warranting nutrition and health education for all populations to improve overall diet, prevent disease, and promote health.

Colorado Situation Influencing Goal III

Elderly Populations

In the 20th century, the number of persons in the United States under age 65 has tripled. At the same time, those 65 and over have increased by a factor of 11. According to the Census Bureau projections, the elderly population will more than double between now and the year 2050, to 80 million. By that year, as many as 1 in 5 Americans could be elderly. Most of this growth should occur between 2010 and 2030, when the "baby boom" generation enters their senior years.

As individuals age, certain physiological changes occur. Lean body mass is lost resulting in an increase in body fat, decrease in basal metabolism, and a decrease in bone density. Slowing of the normal action of the digestive tract takes place, and calcium, vitamin D, and vitamin B12

absorption decreases. Nutrition plays an important role in aging. Most nutrient needs can be met through a healthy and balanced diet, which may ultimately reduce disability, the burden of chronic disease, and even dependency among the elderly. These changes document the importance of elderly nutrition education programs to promote health.

Low Income Populations

The population estimate of Colorado for 1999 is 4,056,133 persons and has been estimated to be growing at about 2.2 - 2.5 % yearly. The number of Coloradans living below the federally designated poverty line is also increasing. The number increased by almost a third from 1980 to a high of 392,938 in 1996 (the most recent data available). The poverty rate for Colorado now stands at an estimated 10.4% compared with 10.1% in 1980. Poverty rates vary by age and living arrangements. In Colorado, while the percent of children in poverty has improved slightly over the ten year period of 1985-1994, the 1995 percentage is 12.2%. For the elderly population, 10.5% of people over the age of 65 are considered low income. The proportion of families below poverty also increased from 1980 to 1990 from 7.4% to 8.6% of total population. Female single parent families have especially high poverty rates. According to the Bureau of Census' Consumer Expenditure Study, 81% of female single parent families nationwide receive public assistance, mostly in the form of food stamps. In Colorado, 17.3% of adults between 18 and 64 reported having no health care coverage.

Hispanic Populations

The Hispanic population represents a growing cultural and ethnic presence within the U.S. and in Colorado. According to the March 1999 *U.S. Current Population Survey* (CPS) estimate, Hispanics currently constitute approximately 32 million individuals total, 11.7% of the population. In Colorado, Hispanics already represent the largest minority at a rate of 14.0%, 535,917 persons. Hispanics as a whole face nutritional and health concerns unique to their genetic admixture, culture, and overall population. Available data shows that Hispanics have significantly higher rates of overweight/obesity (almost 60% are overweight) and diabetes (two to three times non-Hispanic whites), often in concert. Still, heart disease is the number one killer of Hispanics at a rate of 167.8 per 100,000.

Many health problems go undiagnosed in the Hispanic population due to lack of access to health care services, specific cultural and social barriers, and lack of payment for medically necessary services. Almost 40% of Hispanics in Colorado do not have health care coverage—that is the second highest rate in the country. Forty-seven percent of Hispanics also indicated that they had their cholesterol checked in the past five years compared to 65% statewide (all populations combined). Research suggests that the dietary practices of Hispanics adversely affect their risk for several health-related conditions and diseases. Hispanics as a whole have been found to consume diets high in fat at the expense of foods high in complex carbohydrates, fiber, and fruits and vegetables. In fact, 79% of Hispanics in Colorado reported eating fewer than five servings of fruits and vegetables per day in 1998. These statistics point to the need for culturally appropriate and effective nutrition and health education programs to prevent chronic disease and promote awareness about warning signs of serious conditions.

Goal III Overview and Outcomes

Objective III.A: Coloradans will increase their knowledge and adoption of practices that promote healthy lifestyles.

Projected Outputs:
1) Educational programs provided at school, work, community, and health care sites to small and medium size groups;
2) Teleconferences, individualized consultation and distance learning programs to targeted groups.

Projected Outcomes:
Coloradans will increase their knowledge and adoption of practices which promote healthy lifestyles including;
1) balancing food intake with physical activity in order to maintain or improve weight;
2) eating less fat, less saturated fat, and less cholesterol;
3) eating more grain products, vegetables, and fruits and a variety of foods;
4) moderation in salt and sodium and sugars; and,
5) increase moderation among persons who drink alcohol beverages.

Health Promotion and Disease Prevention Outcome:
Participants will enhance adoption of dietary factors related to health promotion and disease prevention.

Year Three Results
Key Themes - Human Nutrition, Human Health, Disease Prevention
--Of 2,740 participants in nutrition and dietary educational programs, 1,731 adopted or strengthened a new behavior as a result of information on food consumption and healthy lifestyle practices.

--Of 1,134 participants in workshops to promote general health and wellness, 1,028 plan to adopt or strengthen one food consumption or lifestyle practice behavior that would promote good health.

--Participants enhanced adoption of dietary factors related to health promotion and disease prevention through individual consultations:
Total number of individual contacts: 32,070
Number who increased knowledge as a result of the contact: 30,053
Number who plan to adopt the recommendation as a result of the contact: 7,410
Number who actually adopted the recommendation as a result of the contact: 1,800

--Participants enhanced adoption of dietary factors related to health promotion and disease prevention through program activities:
Total number of program participants: 63,060
Participant type(s):
Mixed group: 15,000
Consumers: 6,270

Extension staff: 60
FSNEP clientele: 6,000
Professionals: 3,930
Trainers: 60
Volunteers: 300
Youth: 21,090

Number who increased knowledge as a result of the program: 60,240
Number who plan to adopt or strengthen at least one new behavior as a result of the program: 34,260
Total program hours (preparation & delivery): 9,900
Total hours contributed by volunteers: 4,170

--Participants enhanced adoption of food consumption and lifestyle practices that promote good health through individual consultations:

Total number of individual contacts: 9,040
Number who increased knowledge as a result of the contact: 9,040
Number who plan to adopt the recommendation as a result of the contact: 1,680
Number who actually adopted the recommendation as a result of the contact: 3,840

--Participants enhanced adoption of food consumption and lifestyle practices that promote good health through program activities:

Total number of program participants: 74,840
Program participant type(s)

Mixed Group: 7,240
Consumers: 4,760
Extension staff: 1,280
Food handlers: 240
Food managers: 80
Food producers: 3,040
FSNEP clientele: 56,720
Pregnant/lactating females: 40
Producers: 280
Professionals: 320
Trainers: 40
Volunteers: 2,440
Youth: 2,840

Number who increased knowledge as a result of the program: 67,200
Number who plan to adopt or strengthen at least one new behavior as a result of the program: 53,560
Number who actually adopted or strengthened one new behavior as a result of the program: 50,720
Total program hours (preparation & delivery): 19,080
Total hours contributed by volunteers: 7,920

Linkages: (ENP) CSU Department of Food Science and Human Nutrition, 29 County Extension Offices; (CNN) CSU Department of Food Science and Human Nutrition, Cooperative Extension Agents, CSU Department of Human Development and Family Studies; CSU Department of Marketing**;** University of Colorado Health Sciences Center; Colorado Department of Education

(School Lunch and Breakfast Program, TEAM Nutrition); Colorado Department of Human Services (Food Stamps, Commodity Supplemental Food Program, TEFAP, Division of Aging Services); Colorado Department of Public Health and Environment (WIC, CACFP); Colorado Head Start Association, Food Bank of the Rockies, Care and Share. (Dining with Diabetes) Colorado Diabetes Control Program, Medical communities in each of the five pilot counties (includes local hospitals, community health centers, local county health departments, existing diabetes coalitions, etc.)

ENP Collaborating Agencies:

Schools and Child-Care Systems--

Alamosa Open High School (Pregnant & Parenting Teenagers) –San Luis Valley
Board of Cooperative Education Services – Otero Co.
Byron-Syring Delta Center – Rio Grande Co.
Centennial Elementary Parents as Teachers Program
Child Development Center – Crowley Co.
Child Development Center – Otero Co.
Community Partnership for Child Development (Head Start, Evenstart, Free to Grow Program)
Corazon Alternative School
Fairview High School Teen Parents--Boulder Co.
Florence Crittenton Alternative School – Denver Co.
Greeley Central High School – Weld Co.
Harrison High School Pregnant Teen Program – El Paso
Keating Alternative School
La Lave Family Literacy Services – Alamosa Co, Rio Grande Co.
Las Animas School District Re-1
Lincoln Middle School Parents
Longmont Adult Education – Boulder Co.
McClain Community High School – Jefferson Co.
Monterey Elementary Parents as Teachers Group
Poudre R-1 School District Teen Parent Program – Larimer Co.
Rocky Mountain SER – Otero Co., Denver Co.
School District 11 Transitions Program – El Paso Co.
School District RE1J – Gunnison Co.
Skyline High School Life Skills Class
St. Vrain Valley Teen Parent Program – Boulder Co.
Tesla Education Opportunity Program – El Paso Co.
The Village Preschool
Thompson R-1 School District Teen Parent Program @ Ferguson High School – Larimer Co.
Trinidad Public School System – Las Animas Co.
Trinidad State Junior College – Las Animas Co.
San Luis Valley Education Center- San Luis Valley
West Middle School Parents Group
Youth Energy Alternatives Program

Health Care Systems--

Alamosa County Public Health – San Luis Valley
American Lung Association – Pueblo Co.
Arapahoe County Tri-County Health Dept.
Arapahoe House – Arapahoe Co.
Argus Home Healthcare – Pueblo Co.
Boulder Mental Health—Boulder Co.
Cenikor – Jefferson Co.

Colorado Dept. of Public Health & Environment
Costilla County Nursing Service: Home Health Department Commodities Office
Costilla County Public Health Nurses
Gunnison County Public Health Department
Haven House- CU Health Sciences Center, (Fort Logan Campus) – Denver Co.
Healthy Pueblo 2000 Group
Libby Bortz Assisted Living Center
Lincare Home Healthcare – Pueblo Co.
Littleton Senior Housing – Arapahoe Co.
Longmont United Hospital – Boulder Co.
Monfort Children's Clinic – Weld Co.
Options for Long Term Care – San Luis Valley
Poudre Health Services – Larimer Co.
Poudre Valley Prenatal Care – Larimer Co.
Residential Treatment Center – Weld Co.
Rocky Mountain Prevention Research Center – San Luis Valley
San Luis Valley Area Health Education Center
San Luis Valley Mental Health Center
San Luis Valley Regional Medical Center
Spectra Pregnancy Center
Sunrise Community Health Center – Weld Co.
Valley Wide Health Services – San Luis Valley
Weld County Health Department
Women, Infant, & Children (WIC) – Larimer, Otero, Crowley Co.

Social Services & Housing--

Adams State College Family Housing – Alamosa Co.
Alamosa County Dept. of Social Services
Arapahoe County Dept. of Social Services
Arapahoe County Employment & Training Division
Arapahoe County Food Stamp Office
Arapahoe County Family Self-Sufficiency Unit
Arapahoe/Douglas Works!
Azteca Apartments – Pueblo Co.
Boulder Aging Services
Boulder Community Foodshare
Boulder County Child Care Assistance Program
Boulder County Housing
Boulder Emergency Family Assistance
Bridgeway – Jefferson Co.
Care & Share, Food Bank for Southern Colorado – El Paso Co., San Luis Valley
Casa Del Sol Senior Housing
Centennial Village Senior Housing – Weld Co.
City of Boulder Housing
Colorado Works Employment Program – Larimer Co.
Conejos County Dept. of Social Services
Costilla County Dept. of Social Services
Costilla County Housing Authority
Country Manor Senior Housing
Crowley County Social Services
Denver Adult Services
Denver County Food Assistance Program
Denver County Housing Authority

Denver County Social Services
DMA Plaza for Seniors – Larimer Co.
Englewood Senior Housing
Equal Opportunities Program – El Paso Co.
First Steps of Weld County
Food Bank of the Rockies - Denver Co.
Fort Collins Employment & Training Services – Larimer Co.
Fort Collins Housing Authority – Larimer Co.
Fort Collins Kid Care – Larimer Co.
Glendale Family Center
Governor's Farm Senior Housing – Weld Co.
Greeley Manor – Weld Co.
Greeley Senior Housing – Weld Co.
Gunnison County Dept. of Social Services
Gunnison County Housing Authority
Housing Authority of Pueblo
Huerfano County Dept. of Social Services
Jefferson County Dept. of Health & Environ.
Jefferson County Human Services/Tri-County Workforce Development Center
La Gente Family Advocacy Programs – San LuisValley
Lamar Housing Authority – Prowers Co.
La Puente/Adelante – Alamosa Co.
Las Animas County Dept. of Social Services
Loveland Employment & Train. Services – Larimer Co.
Loveland Kid Care – Larimer Co.
Oakbrook I Apartments – Larimer Co.
Otero County Social Services Dept.
Posada Homeless Family Shelter
Prowers County Social Services
Pueblo County Dept of Housing & Human Svs.
Pueblo County Dept. of Social Services
Rio Grande-Mineral Counties Dept. of Social Services
Saguache County Dept. of Social Services
Six Points – Gunnison Co.
Southeast Aurora Family Resource Center
Sparks Residential Supportive Services – Pueblo Co.
Springfield Court Apartments – Larimer Co.
St. Thomas Food Bank
Tri-Lakes Cares Food Pantry
Walsenburg Housing Authority – Huerfano Co.
Weld County Social Services and Human Services
Weld Food Bank – Weld Co.
Workforce - Boulder Co.

Community Services--

Action Against Domestic Assault
Action Against Hunger and Malnutrition – San Luis Valley
Advocates Against Domestic Assault
Aggie Village Single Parent Support Grp – Larimer Co.
Alamosa Senior Center – San Luis Valley
Aurora Family Resource Center
Bellevue Senior Center – Larimer Co.
Blanca-Ft. Garland Community Center–San Luis Valley

Boulder Project Self-Sufficiency
Boulder Senior Center
Boys and Girls Club of the San Luis Valley
Child Advocacy Resource & Education – Weld Co.
Child and Adult Care Food Program
Children's Services of Colorado
Coalition for the Homeless
CO Coalition on Hunger & Food Policy Group
Colorado Office of Resource & Referral Agencies, Inc – San Luis Valley
Community Infant Project
Corazon Senior Center
Crowley Ladies Society – Crowley Co.
Education and Life Training Center – Larimer Co.
Family Independence Initiative Project
Family Tree/Karlis Center
Fostering Better Communities
Fowler Senior Center – Crowley Co.
Fountain Valley Senior Center – El Paso Co.
Hancock Senior Center – El Paso Co.
Hillside Community Center – El Paso Co.
Jefferson County Adolescent Pregnancy &
Parenting Program (JCAPPP) – Jefferson Co.
Joseph Edwards Senior Center - Pueblo Co.
La Junta Senior Citizens Center – Otero Co.
Las Animas/Huerfano County of Council of Governments
Longmont Career Development Center – Boulder Co.
Louisville Senior Center – Boulder Co.
Meadows Park Community Center – El Paso Co.
Mi Casa Resource Center for Women – Denver Co.
Monte Vista Public Library – Rio Grande Co.
Morningstar Adult Day Care
Nine News Health Fair – Gunnison Co.
Northside Aztlan Center – Larimer Co.
Ordway Senior Citizens – Crowley Co.
Partners for Healthy Families – Jefferson Co.
Pueblo Parks & Recreation
Pueblo Senior Resource Development Agency
Sage Center – Rocky Ford – Otero Co.
Salvation Army – Denver Co., Boulder Co.
San Luis Valley Area on Aging
San Luis Valley Cattlewomen's Association
San Luis Valley Community Connections
Senior Nutrition Program – Larimer Co.
Senior's Resource Center – Jefferson Co.
Share Colorado – El Paso Co., Larimer Co.
Share Our Strength/Operation Frontline – Weld Co., Larimer Co.
Southern CO Developmental Disability Services – Las Animas Co.
Taking Off Pounds Sensibly – Pueblo Co.
Teen Lunch Bunch – Gunnison Co.
Tri-County Senior Center – San Luis Valley
Volunteers of America

Walsenburg Community Center – Huerfano Co.
Wellington Senior Center
Yellow House Senior Group
For Profit Organizations--
King Sooper's Grocery Stores – Colorado
Mercy Housing Services Corp. – El Paso Co.
Safeway Grocery Stores - Colorado
Ministerial and Church-Related Groups--
Boulder Interfaith – Boulder Co.
Baptist Church – Saguache Co.
Catholic Charities Northern – Larimer Co.
Catholic Community Services
Catholic Churches - Costilla Co., Saguache Co.
First Presbyterian Church – Larimer Co.
Lutheran Services Inn Between Program
Las Animas Pastoral Center
Nederland Presbyterian Church
Presbyterian Towers
Sister Carmen Center
St. Joseph's Church
Valley Church of the Nazarene – San Luis Valley
Court Systems--
Colorado Dept. of Corrections – Crowley & Pueblo Co.
Larimer County Community Corrections
Larimer County Detention Center
Transitional Center for Women – Weld Co.
Weld County Community Corrections Board
Youth Offender System – Pueblo Co.

Objective III.B: Communities will improve their capacity to address health and nutrition related needs.

Community food security is focused on meeting the food needs of low income communities, but is much broader. Overall it seeks to build food resources within a community--rather than encourage dependence on outside sources--to meet its own needs. It involves a wide range of activities, such as creating and expanding local infrastructures, increasing economic and job security, strengthening the federal nutrition assistance safety net, bolstering supplement food from nonprofit groups, improving community food production and marketing, boosting education and awareness, and improving research and evaluation. It integrates aspects of many different fields, such as public health, ecology, and community economic development.

Projected Outputs:
Brochures, personal consultation, and letters describing available resources to promote health and nutrition in the community from Extension educators and state specialists to key community organizations, professionals in the health and education arenas and agency and governmental managers.

Projected Outcomes:
1) Increased number of joint health and nutrition related educational sessions offered within the community;
2) Increased number of organizations who request educational sessions from Extension educators;
3) Increased number of communities who institute health needs assessments;
4) Increased number of community groups who initiate health related activities, healthy food choices, or volunteerism in health and nutrition related activities; and,
5) Increased number of community members who are trained as volunteers in La Cocina Saludable, Master Food Preservers, or Team Nutrition members.

Year Three Results
Key Themes - Human Nutrition, Human Health, Nutrition Network
--Ten community groups enhanced their ability to address gaps in health related needs by collaborating with Cooperative Extension.

--A total of 12,803 citizens accessed more nutrition diets through support from community systems and collaborations.

--In Boulder County, CO, a Master Gardener was approached by her church to plan a community garden in celebration of the Jubilee Millennium celebration of the Roman Catholic Church. A small garden was begun with seeds donated by the local food bank. Obtaining donations of goods and financial support as well as time from volunteers, the Master Gardener developed the garden into a quarter-acre, which harvested 3,600 pounds of vegetables in 2002. The vegetables were all donated to the community food bank and largely distributed to the elderly poor in the county. This special community project received extensive media coverage in the Denver papers and television outlets.

--In Moffat County, CO, a collaboration with WIC clinics and the Visiting Nurses Association enabled nutrition classes to be offered in Spanish while WIC clients were waiting for their vouchers and checks. An interpreter available at the clinic assists with the nutrition classes so that attendees may hear the lesson in both English and Spanish. This enabled a new audience to be reached through a community collaboration. In that same county, a collaboration with seven other community agencies and the Colorado Trust Healthy People grant enabled community-wide programs to be initiated in fitness, diabetes education, eating disorders and nutrition for all ages.

--In Eagle County a 231% increase in the Latino-Hispanic population between 1990 and 2000 resulted in compelling community needs for bilingual education. A nutrition educator was hired with Spanish speaking skills and new nutrition classes were created for low-income Spanish speaking families.

Linkages: CSU departments of Food Science and Human Nutrition and Health and Exercise Science, County Extension faculty; Colorado Department of Health and Environment, Colorado Department of Local Affairs, Colorado Department of Agriculture, American Heart Association, Colorado Nutrition Network, Head Start.

Source of Federal Funds:

Scope of Impact: Statewide

Integrated CE/AES work:

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	2	2	3	4	4	1,544,816,
County FTE	3	8	3	3	3	1,148,265
Total FTE	5	10	6	7	7	2,693,081
Budget	422,755	445,196	519,306	615,858	615,858	

Objective III.C: Improve the nutritional status and health of school and community athletes.

Building Youth Through Effective Coaching (BYTEC) started as a two-day class providing continuing education training for area school and town recreation coaches on the topics of nutrition, physical development and training practices, and youth development. Using campus staff and private consultants, credit classes are offered to coaches in rural Colorado. In the rural area of Elbert County, CO, more than 1,800 students are impacted each year through athletic programs. Informal visitations with athletic directors in Elbert County and local parent groups revealed that coaches and students would benefit from a program that would bring them up to date on current practices within the youth athletic arena and, at the same time, help them refocus their programs as youth development opportunities.

Coaches in rural Colorado are not only long distances from campuses but have limited access to quality in-depth programs in the area of coaching. In addition certified teachers that were also coaching needed college credits to advance on the salary scale and renew their certificates. There was also a concern expressed during the informal visitations that some coaches were losing the youth development focus of their programs.

Projected Outputs:
Workshops for community coaches and athletic directors on topics related to basic nutrition of performance, weight loss, gain, or maintenance.

Projected Outcomes:
1) Participants will demonstrate a 25% increase in their knowledge of the topics;
2) Participants will adopt at least two new ideas in their programs;
3) Increased requests for educational materials and presentations to coaches, athletes, and parents;
4) Decreased athletic injuries and health problems related to inappropriate use of exercise, supplements, stimulants, or unbalanced diets.

Educational Strategies:

The BYTEC program brought the University to the people, bridged the gap between research and application, and improved the quality of instruction for young athletes. The program also provided participants with techniques that help them establish a positive atmosphere for youth development. The program used five instructors who incorporated numerous hands-on activities, small group work, and lectures over a two-day period. Some activities that were used included hands on demonstrations in the weight room with lifting and stretching techniques and small group work in the areas of nutrition and parent/coach/player relationships. The program covered the following topics:

Energy Systems, How Muscles Work, Ergogenic Aids
Hydration and Fluid Balance
Lifting and Stretching Techniques
Principles of Training
Nutrition Fundamentals, Meal Planning, Eating Disorders
Communication, Ethics in Coaching, Parent Meetings, Conflict Management
Forgiveness and Apologies, Organization, Practice Planning
Sports First Aid, Legal Responsibilities
How Students Learn, Promoting Lifelong Activity

Year One Through Three Results

Pre and post evaluations were given to each participant asking them to rate their knowledge on a scale of one to ten, with one being the least amount of knowledge and ten being very proficient. The participants were also asked to list any ideas that they would take and use in their program.

Outcomes:

--Results of the evaluations showed that participants' knowledge increased an average of 31%. The average knowledge rating prior to the program was 5.44 and 7.14 after the program. On the average participants listed three new ideas that they felt they would take back and use in their programs.

--Coaches who participated were asked to list ideas that they would take and use in their program. Listed below are sample responses from the list of sixty-five ideas that participants indicated they would use:

Provide improved information on supplements
Use new motivation techniques for students and parents
Emphasize better dietary habits
Re-introduce the importance of nutrition
Promote drinking water during practices
Implement better strength training and progression schedule
New exercises with abs, plyo's, and lifting techniques
Use Plyometrics in conditioning programs
Ergogenics-filtering the media and any misleading information about supplements

--Two years later, a random sample of participants was surveyed over the phone and asked "What changes did you make because of the class and how did that impact kids?" These participants indicated the following as additions to programs and impacts on students:

Developed and distributed nutritional packets to weight lifting classes and students reported that they were eating breakfast more often due to the information.
Incorporated more nutrition information for parents and kids
Improved communication with athletes and parents
Improved relationships with kids and parents because of better communication
Reported more parent support for kids and coaches
Increased emphasis on water intake during practices
Increased availability of water and increased number of breaks
Developed a new handbook that was more professional and students commented that the atmosphere was more "high class."
Observed fewer muscle cramps during practices
Observed students being more self-advocating for water intake and better nutrition due to the increased emphasis by coaches.
Increased the time spent and added more stretching activities in pre-practice and game situations.
Increased parent involvement and education of their program by creating car pool groups and dinner groups which lead to better information dissemination so that kids would have less stress and generate a sense of community and team.

--Information collected from the participants on evaluation forms precipitated several changes. The program has been lengthened to four days, and units have been enhanced as requested by the participants. Additional personnel have been added to improve the depth of the content. Two notebooks with information about each topic will be available instead of one.

--Participants commented on the overall program as "Great Stuff," "Can't wait to use it," "Best seminar I have had," and "Very good and interesting." The response to the program two years later during the phone survey was still very positive.

Linkages: Departments of Health and Exercise Science, Food Science and Human Nutrition, Colorado State Coaches Association, Colorado School District

Source of Federal Funds: Smith Lever

Scope of Impact: Colorado specific

GOAL IV: Greater harmony between agriculture and the environment.

Issue: *Agriculture is still a strong contributor to the economy of Colorado and citizens of the state are increasingly concerned about protecting the rich natural resources. Population growth is largely accounted for by persons retiring to Colorado for recreational environments, and by persons who seek a high quality of life including the enjoyment of resources of a beautiful and healthy environment. Rapid population growth has transformed grasslands and irrigated crop lands into suburban housing developments. An increasing number of property owners with acreages from 1 to 50 are finding threats to their chosen life style. Waste management, water quality control, noxious weed management, animal health, pasture management and conflicts*

with wildlife are all challenges to unprepared small acreage owners.

With the increasing numbers of urban citizens wielding political power at the county commission and legislative levels, the sustainability of a healthy agricultural industry and reasonable environmental regulations is increasingly difficult. Among agriculture producers there is a need to increase the use of consistent records for decision making, particularly in those areas related to the application of chemicals and pesticides of specific water management techniques. There are approximately three million acres of irrigated crop land in Colorado. Salt affected soils and challenges to water rights are increasingly problematic for communities and land owners.

Prairie dogs have been viewed as a major agricultural pest by landowners in Colorado. According to the Colorado Agricultural Statistics Service, about 1.5 million acres were occupied by prairie dogs in Colorado. Estimates of damage caused by prairie dogs to agriculture are $10 million, and over half the acreage and damage was attributed to black-tailed prairie dogs. Although black-tailed prairie dogs appear fairly abundant in Colorado, their populations have been significantly reduced across their historic range. Thus, environmental groups have petitioned the U.S. Fish and Wildlife Service to list the black-tailed prairie dog as a threatened species. With these conflicting values and needs, it is apparent that some prairie dog populations will need to be protected/preserved whereas others may need to be controlled to minimize conflicts.

Colorado Situation Influencing Goal IV

Insects and Mites

Management of insect and mite pests challenges Colorado field crop producers because 1) pests vary in abundance and economic importance; 2) pest management tools are in a state of flux; and 3) societal concerns about pesticide use in production agriculture are increasing.

The major field crops grown in Colorado are corn, wheat and alfalfa hay. Other important crops include dry bean, sunflower, sorghum, barley and proso millet. The total acreage devoted to these crops exceeds 5.5 million. Their production forms an important part of many rural economies. For example, wheat is produced in 41 Colorado counties.

All Colorado field crops are affected by a complex of insect and mite pests. The major pests of corn are Banks grass mite, European corn borer, western bean cutworm and western corn rootworm, while wheat is attacked by army cutworm, brown wheat mite, pale western cutworm, Russian wheat aphid and wheat curl mite. Field crop pests vary in economic importance, but can be quite significant. For example, more than 4 million acres of Colorado wheat were sprayed for Russian wheat aphid during the period 1986 - 1998. The economic impact of this pest during the same period is estimated to be in excess of $125 million in lost production and increased costs.

Management of insect and mite pests presents a dynamic challenge to producers of field crops in Colorado for several reasons.

--Pest abundance varies both temporally and spatially. A given field may be infested at economically significant levels, while neighboring fields may be spared. Economic infestations may be widespread in one year and rare in the next.

--The relative economic status of field crop pests varies as well. During periods of depressed commodity prices pest management decisions become more difficult as treatment costs represent larger proportions of profit margins. Pest status is more clearly defined and treatment decisions are more easily justified during periods of strong prices.

--Pest management tools are in a state of flux as well. On the one hand, the number of traditional

chemical pesticides available for use against these pests is diminishing at an unprecedented rate. On the other hand, new alternatives, particularly plant-delivered pesticides such as Bt corn and other "GMO" traits, can be expected to increase rapidly.

--Societal concerns about pesticide use in production agriculture are also increasing. Growers, particularly along the Front Range, are under increasing pressure to find alternatives to their use of traditional chemical pesticides. It is currently unclear as to whether plant-delivered pesticides will be considered acceptable alternatives.

Weeds

Invasive weeds are an insidious threat to agriculture and natural areas in Colorado and elsewhere in the western United States. Invasive weeds decrease the carrying capacity of rangeland for livestock and wildlife; decrease biodiversity that evolved among members of native plant communities in our state; interfere with crop production; decrease land values; increase soil erosion; and rob the aesthetic beauty of our state's natural areas. A Colorado survey conducted in 1998 reported that almost 1,000,000 acres were infested with 11 invasive weeds. Invasive weeds can increase their populations at alarming rates; for example, acres infested with leafy spurge increased from 44,800 acres in 1989 to 96,800 acres in 1998.

Because of their widespread distribution and impact in our state, invasive weeds are a serious problem for all Coloradans, but especially for ranchers, farmers, small acreage owners, and public land managers associated with city, county, state, and federal lands. There is a distinct need for greater awareness regarding invasive weeds among private and public land managers as well as decision makers such as county commissioners, state legislators and the administration, and members of Congress and the federal administration. Education is a powerful vehicle to foster increased awareness. More information is needed with regards to mechanisms of weed invasion and expansion to better understand their ecology. Understanding invasive weed ecology more thoroughly will help to design integrated weed management strategies that foster use of successional weed management to create desirable plant communities that help achieve land management goals.

Relevant research that increases our understanding of invasive weed ecology is needed as well as research that defines combinations of control methods to create successional weed management approaches. Summarizing this relevant research in written publications and orally in public presentations is an excellent means to produce the educational information necessary to heighten the public's awareness with regards to the ecology, impact, and management of invasive weeds.

Crops and other plants of interest are grown in a wide variety of agro-ecosystems and environments. Both dryland and irrigated cropping systems are extremely important in Colorado. This variety provides a tremendous challenge to the effective management of weeds, insect pests and plant diseases. Crops are infested with or compete with an amazing array of pests that reduce yield and quality. As a result pest management is one of the most costly inputs growers (and ultimately consumers) must finance every year. In 1998, Colorado growers reported that $90,157,000 were spent on pesticide inputs alone, the total input expenses were $4,115,610,000 (Colorado Agricultural Statistics, 2000).

A Pest Management Center (PMC) is being formed with a stakeholder advisory board. The Minor Crop portion of the program has already established a stakeholder board. The Pesticide Applicator Training portion of the program meets jointly with the Colorado Department of Agriculture's Division of Plant Industries' Pesticide Section and the Applicator Workshop providers for direction and feedback.

Goal IV Overview and Outcomes for Program Year 2001

Objective IV.A: Increase the adoption of research based best management practices to control weeds, insects, disease and nematodes for wise use of agriculture chemicals and for ground water protection.

Projected Outputs*:*
1) Resource manuals and research summaries on pesticides, fertilizers, and nutrient management;
2) Best management practices demonstrations;
3) Field schools to education crop advisors and producers;
4) Development of best management practice manuals for irrigated corn production, alfalfa, and legume production; and
5) Provide clientele with the reasons why invasive weeds should be managed and how to effectively manage them.

Projected Outcomes*:*
1) Increased producer adoption of best management practices such as integrated management and biological controls developed with research in Colorado;
2) Decrease in ground water nitrite levels;
3) Reduced crop loss and lower production costs due to weeds and pests;
4) Increase of 25% in the number of organized invasive weed management areas in Colorado during 2001 and double over the next 5 years;
5) If field crop producers make decisions in response to pest situations then insecticide and miticide use should fluctuate as pest populations fluctuate; pest activity should correlate with pesticide use;
6) If a chemical control alternative is viable then adoption of that alternative should be measurable because producers need ways to cut costs and reduce environmental impact.

Noxious Weed Management

Over the next five years, the number of organized weed management areas in Colorado will double. Weed management areas typically surpass political boundaries and usually are formed around logical geographical barriers of weed movement. These often are watersheds, but landowner associations also form small weed management areas. At either extreme, the formation of weed management areas is founded within the concept of the Enlibra Doctrine created by the Western Governors' Association. County Commissioners will be a driving force behind the increase in weed management areas because of money currently available through the state Noxious Weed Management Fund, the National Fish and Wildlife Federation funds, and new monies that will be made available after pending federal legislation is passed by Congress. Improved organization and coordination will occur as the number of weed management areas increases and thus, the number of acres infested with invasive weeds that are being managed also will double over the next 5 years. Continued education of state legislators and the Governor's administration will foster an increase in the amount of money that the Legislature will make available for the Noxious Weed Management Fund. Colorado State University is trying to create an organized, statewide outreach program on invasive weeds and the continued education of our

state government officials will help to make this plan become reality. Continued education of Congress and the President's administration will help make available significant increases in funds for which weed management areas within states can compete. Organized weed management areas will utilize a successional weed management framework to achieve pre-determined land management goals.

Manure Management to Protect the Environment

Colorado has a $2.6 billion equine industry and many horses are managed by small acreage owners. Many of these owners lack technical research based skills to effectively manage the environmental challenges on their property. A series of half-day horse manure management workshops were held around the state in 2002. As part of the program, a new manure composting mentoring program was begun. Participants in the workshops were invited to participate and the state and county faculty visited their operations to assess current practices. They were given advice about how to begin a composting program or to improve what they were already doing. To date, 15 individuals are participating in the program which carries an expectation that they will provide an open house to increase the impact of subsequent workshops and demonstrations and thereby increase adoption of new management practices among area horse owners.

Turfgrass Management for Conservation

The green industry is the largest growing sector of Colorado's agricultural community. An estimated $600 million is spent annually by Colorado homeowners to care for their lawns with an additional $150 million spent in maintaining Colorado's 30,000 of golf courses in top condition. Thirty-five to 60% of the water used in western metropolitan areas during summer months is applied to landscape areas, especially turfgrass and frequently, homeowners over-apply water to turfgrass. An estimated 17% of household waste in landfills is landscape related, including turf materials.

Year Three Results

Key Themes - Integrated Pest Management, Invasive Species

--Out of a total of 17,085 participating agriculture producers and land managers, 9,561 indicated they had increased their knowledge in how to integrate their production practices with environmentally sound decision making; 2,665 agriculture producers or land managers improved their acreage management through integrated production practices coupled with environmentally sensitive practices out of a total participation of 8,382 individuals (32%). These individuals managed a total of 648,507 acres with improved best management practices.

--In Jefferson County, CO, a suburb of Denver, the Native Plant Masters program is a collaborative effort with Colorado State Parks, the Lookout Mountain Nature Center and the Colorado Mountain Club and includes participants from 21 natural resource agencies who encourage use of native plants in landscapes to increase landscape plant diversity, and reduce reliance on pesticide options to control landscape insects, diseases and weeds. In-depth training for public-land agency staff and volunteers is through a train-the-trainer approach that requires participants who complete the training to commit to educating homeowners and public audiences and sharing information; 85% of those trained reported they used information gained from the program to educate others about the impact of weeds on native plants, and about the value of using native plants for landscaping including their value in water conservation efforts.

--The 124 Native Plant Masters trained to date have logged more than 43,400 educational contacts as part of their commitment to share information; and in classes taught by these Native Plant Masters, 90% of participating homeowners reported that they plan to include native plants in a sustainable landscape on their own properties. One Native Plant Master—a water district staff member—developed a plan to offer rebates to homeowners who use native plants in xeriscape landscapes; another used the information in curricula developed for other naturalists.

--Of 3,373 agriculture and natural resource managers who attended Cooperative Extension educational programs, 1,849 developed effective relationships with regulatory agencies and public officials who monitor urban-rural conflict issues. In addition, of these attendees, 2,280 reported developing processes that increased understanding and achievement of mutual goals between agriculture and natural resources.

--Fifteen planning groups were established with the support of Cooperative Extension and other community partners to negotiate animal-human conflicts and/or endangered species habitat protection issues in Colorado.

Linkages: CSU departments of Bioagricultural Sciences and Pest Management, Soil and Crop Sciences and Chemical and Bioresource Engineering (Civil Engineering), state, regional, and county faculty; U.S. Forest Service, Bureau of Land Management, Colorado Division of Wildlife, Colorado State Parks, County Weed Districts, Colorado Dept. of Transportation, Colorado Department of Agriculture, Colorado Department Health and Environment, Colorado State Legislature, specific commodity groups, counterpart specialists and departments in western Nebraska, Wyoming and Montana.

Source of Federal Funds: Smith-Lever

Scope of Impact: Multi-State with Montana, Nebraska, Arizona, and Wyoming.

Integrated Agriculture Experiment Station/Cooperative Extension Programs:

Ongoing research on projects on biological and ecological weed management and pest management practices (#221, 618 and 646) provides information to assist Extension educators and producers.

Southeast Colorado Dryland Cropping Systems and *Northeast Colorado Dryland Cropping Systems* addresses Cooperative Extension educational strategies for Colorado (and proximate locations in Kansas) producers working with dryland cropping and limited irrigation systems.

Eastern Regional Range-Livestock Drought Mitigation Plan provides information in the mitigation, management, and recovery from drought for managing range, grazing, livestock and wildlife production.

Resources from CE: 1.3 FTEs.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	2.5	3	4	4	4	1,689,643
County FTE	1	6	2	3	4	918,612
Total FTE	3.5	9	6	7	8	2,608,255
Budget	317,929	417,936	539,307	615,858	692,409	

Objective IV.B: Increase the effective management of pests in agriculture systems and landscapes.

Colorado State University (CSU) has been an active participant in the Smith-Lever 3 (d) federally funded Cooperative Extension Integrated Pest Management (IPM) program through its statewide Cooperative Extension IPM effort since 1978. The basic work plan for Colorado IPM was developed in 1978 based on guidelines provided by USDA/CES.

The initial program area, potato IPM in the San Luis Valley, was initiated in 1974. These efforts build upon and complemented the excellent seed certification program already in operation at that time in the San Luis Valley. By 1983 this program had been completely turned over to area potato growers. IPM programming and implementation in Colorado to date has been along single crop lines targeting multiple pest/disease problems. IPM programs in SLV Potato IPM, Western Slope Fruit IPM, and Urban IPM are continuing with grower control and funding. The San Luis Valley Potato IPM program was expanded into a High Valley Irrigated Crops IPM program that integrated alfalfa and small grains. That effort was supported by the Water Quality Project and local growers. A potato late blight exclusion component also was added. Golden Plains Corn Survey/IPM and Bean IPM are two IPM programs that are to be the basis of a High Plains Irrigated Crops IPM implementation program that will also include potato and sugarbeet. An integrated implementation team is planned in the area from growers, agri-industry, environmental/consumer and scientists from a variety of organizations. This project will concentrate in northeastern Colorado and adjacent areas in the Nebraska Panhandle and eastern Wyoming.

Present IPM implementation in the target area has been along commodity lines. The Golden Plains Pest Survey program is principally an insect monitoring, scouting and forecasting program. It was jointly funded by USDA/CE IPM, growers, and industry. Now it is completely funded by participants (growers, agri-industry) Bean IPM on the principal diseases is well established. A comprehensive weather station system and forecasting program is in place. A 5-stage model developed by the IPM team uses data on the previous season's rust pressure, evidence of rust survival (volunteer bean infection), rainfall and temperature conditions during volunteer emergence, subsequent rainfall and temperature conditions during crop growth and plant stage when initial infection occurs to determine spray dates. The Golden Plains Pest Survey system utilizes six radio stations and eleven newspapers in addition to 1788 direct FAX Alerts to subscribers. In the Bean IPM program, weather information (COAGNET) is collected in cooperation with USDA and along with pest/disease information carried by DTN, Pest Alert, radio etc. Also weekly updates (BEANET & ONIONET) furnished to 2000 growers and commercial subscribers. These communication systems will be integrated along with the PEST

ALERT newsletter that now is carried on the World Wide Web, by e-mail and hard copy to subscribers.

Historically the Urban IPM program in Colorado has focused on Master Gardener training, green industry training and support and a youth awareness program. A major component has been proper diagnosis of plant pest problems and recommendations of integrated pest management strategies through the Metro Area Plant Diagnostic Clinic and Education program, located in the Denver metropolitan area (Jefferson County).

The majority of the State's population (79%) lives in an urban area. As population numbers are projected to continue to increase over the next ten years, while Urban IPM staff support is not, it is imperative that Colorado's Urban IPM program be enhanced. The expanded goal of urban IPM is to expand the training and information, already offered to Metro area Diagnostic Clinic volunteers in Jefferson County, to Extension volunteers and green industry workers throughout the region. Areas of emphasis will be in pest diagnosis and management solutions, emphasizing IPM techniques and environmentally sound practices.

Projected Outputs:
1) Electronic newsletter (pest alert);
2) Establishing a Web-site to promote IPM information;
3) Fact sheets;
4) A multi-crop irrigated IPM system in northeastern Colorado rather than single commodity programs;
5) *Advanced training to Master Gardeners and Green Industry (horticulture professionals) in diagnostics and IPM tactics;*
6) A core or standardized curriculum for diagnostic clinic/IPM training;
7) Diagnostic capabilities with the use of digital diagnostic equipment;
8) A school-based IPM program.

Projected Outcomes:
1) Enhanced grower/crop consultant/master gardener understanding of the ecological and economic impact of pests on crop production;
2) Increased use of non-chemical pest management alternatives;
3) Reduction in crop losses due to pests;
4) Reduced pesticide use or change to "lower risk" pesticides;
5 Improved commercial producers profit margin; and
6)Increased IPM awareness by teachers, administrators, facility maintenance professionals and students (K-12).

Year Three Results
Key Theme - Integrated Pest Management

Management of Pests in Agricultural Systems
--Of 100 managers who participated in an Extension program, 80 plan to increase use of best management practices.

--Ten of 18 green industry professionals plan to use best management practices for horticultural decisions.

--Of 3,769 participants, 1,794 plan to adopt research-based best management practices for

agricultural chemicals, ground water protection and control of weeds, insects, nematode diseases and other pests.

--Improved weed, disease, and/or pest control resulted in a reduced crop loss and/or lower production costs on 227,839 acres according to land manager reports.

Supporting Small Acreage Owners

--Many small acreage owners are in great need of technical information to manage pests in their environment. Participation by Colorado in the Western SARE funded program for developing a small acreage curriculum has resulted in much wider adoption of educational sessions for small acreage owners. Educational programs during 2002 resulted in 7,308 out of 9,608 participants in small acreage workshops and field days increased their knowledge on how to maintain or enhance the quality of their natural resources.

--Out of 9,107 participating small acreage owners, 5,356 indicated an increase in knowledge about the planning demands for successful rural living. Of these attendees, 103 indicated an increase in knowledge about chemical safety procedures, 399 increased their knowledge of pasture management and 1,508 increased their knowledge in weed management. In addition, 183 participants indicated an increased knowledge of weed and a poisonous control plan.

--Three hundred forty-nine small acreage owners who attended educational workshops increased their knowledge in windbreak, tree and shrub management to protect landscaping.

--Out of 600 attendees at small acreage owner workshops, 322 participants indicated they adopted practices in their weed management plan; 245 individuals indicated they had adopted a total management plan to enhance the quality of their natural resources.

Linkages: CSU departments of Bioagricultural Sciences and Pest Management, Rangeland Ecosystem Science, Soil and Crop Sciences and Chemical and Bioresource Engineering, CSU College of Forestry, CSU Agricultural Experiment Station, and state, regional and county faculty; USDA-ARS, Colorado Climate Center, Colorado Department of Agriculture, Colorado Department Health and Environment, Colorado State Legislature, United States of America Environmental Protection Agency, United States of America Animal Plant Health Inspection Service, Colorado Water Quality Task Force, and specific commodity groups.

Source of Federal Funds: Smith-Lever

Scope of Impact: State Specific

Integrated Agriculture Experiment Station/Cooperative Extension Programs:

Colorado Environmental Pesticide Education Program (CEPEP) is part of the Department of Bioagricultural Sciences and Pest Management Research and Extension in the College of Agriculture. CEPEP has a unique, interdisciplinary purpose relative to pesticide issues through working relationships, liaisons, and communications with federal, state, and industrial representatives. CEPEP has four primary areas of emphasis – Pesticide Safety Education (PSEP), Pesticide Use and Needs Assessment, Minor Crop Pest Management with IR-4 (Interregional Research Project #4) and Pesticide Information Transfer.

Sustainable Organic Integrated Fruit Production is an important part of the agricultural resource base in the Tri-River Area (Delta, Mesa and Montrose counties) of western Colorado. The Extension and Research Center team develops and conducts educational programs based upon grower needs and responds in a timely manner to grower concerns and opportunities. Topics addressed include production techniques, pest control (disease, insect, mite, weed, etc.) pesticide selection and use, and crop management options. Growers learn how to select and use options in fruit production that will allow them to sustain production in both conventional and organic production systems. Extension and Research Center staff facilitate workshops, talk at industry meetings, conduct test plots, visit production sites, and distribute information via the bimonthly Fruit Growers Newsletter and the voice-messaging Code-A-Phone system.

Improving Certified Seed Potato Production and Management addresses the needs of Colorado's potato industry—a progressive and rapidly growing entity. Annually, new cultivars, production techniques and equipment are adopted and new disease and pest problems, cultivar concerns and grower production problems occur. Between managing the old problems, identifying and managing the new ones and working with new technology, the growers and the certification program are constantly being challenged. Because of this, a comprehensive research and extension program focusing on these issues is not only expected, but a necessity if we are to maintain an active, healthy seed industry. Thus, seed related research that is feasible and problem oriented is ongoing. Extension efforts will focus on integrating management strategies for disease and pest problems that will mitigate or eliminate their threat. Grower contacts and meetings to work with new technologies and production techniques are emphasized. Internal changes in the Potato Certification Service make the organization more efficient, utilizing the most up-to-date disease testing, tissue-culture production, and inspection techniques.

Colorado Row and Vegetable Crop Foliar Disease Management program studies the biology of priority fungal and bacterial pathogens which cause economic losses to commercial row and vegetable crops such as dry bean, onion and potato in Colorado. A component of the program is to apply modern technology (Global Positioning System hardware and Geographical Information Systems software) to improve disease survey efficiency and accuracy. A statewide network of remote electronic weather stations has been established in collaboration with the Colorado Climate Center and USDA/ARS to monitor weather variables that influence crop and pest development and disease forecasting. The project emphasizes technology transfer of Integrated Pest Management principles and practices via traditional means (newsletters, bulletins, videotapes, meetings, field days) and innovative approaches (DTN, satellite, internet, CD-ROM) to provide, research teaching and extension personnel with interactive, timely and effective resources to address the needs and concerns of clientele in Colorado and the surrounding region.

The *Commercial Vegetable Crop Production* program supports the Arkansas Valley producers with information on vegetable varieties, onions, melons, peppers, tomatoes, and plasticulture.

Field Crop Entomology provides management information on insect and mite pests of Colorado field crops including wheat, corn, alfalfa, sunflower, dry bean and millet. Up-to-date information and applied research on key pests (such as Russian wheat aphid, Banks grass mite and alfalfa weevil) as well as a timely response to new or rare pest occurrences are emphasized.

Technology Assessment, Applied Research and Information Delivery for Potato Production in Colorado assists one of the most progressive and rapidly growing agricultural industries in Colorado. Each year new varieties, production techniques and equipment are adopted. While potatoes respond to such changes, old production-limited factors seldom go away. Many of these factors are of disease origin and have complicated etiologies. Moreover, they are often unique to

Colorado and require site-specific solutions. Consequently a focused, ongoing effort to understand and solve production-limiting factors is essential in order to sustain Colorado's potato industry. Our potato growers are well aware of this situation, willing to fund research and expect CSU staff to respond accordingly. The project develops research proposals that that are feasible given current restrictions on time, funds, labor and facilities; pursue areas of research based on real industry needs and personal expertise; and develop meaningful reports that provide growers with useful information.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	6	4	8	8	9	3,765,489
County FTE	2	2	3	4	4	1,224,816
Total FTE	8	6	11	12	13	4,990,305
Budget	732,408	308,143	1,002,061	1,078,612	1,175,163	

Objective IV.C: Enhance wise soil management decision making.

The USDA/EPA Joint National AFO Strategy released in 1999 proclaimed a national expectation for all animal feeding operations to develop and implement Comprehensive Nutrient Management Plans. According to the USDA-Natural Resources Conservation Service, there are approximately 1500 animal feeding operations in Colorado, all of which need to develop Comprehensive Nutrient Management Plans.

The implementation of Amendment 14 in Colorado begun in 1999 set a precedent for air quality regulation in agriculture. Air quality concerns continue to mount including odor, dust, greenhouse gases, and ammonia emissions.

More livestock producers are composting now than in the past and are looking for ways to market their manure. Using manure or composted manure for high-value uses that benefit from manure's soil amending properties, not only its fertilizer value, can lead to greater affordable hauling distances. Thus, manure concentration and water quality impairment can be reduced in some areas, while improving soil quality in other areas. Agricultural producers and land managers who participated in education opportunities designed to increase their knowledge about best management practices and allow them to improve acreages they manage by integrating production practices with environmentally sound decision-making were polled for the impact of their experiences.

Projected Outputs:

1) Manure management (Comprehensive Nutrient Management) plan workshops;
2) On-farm best management practice demonstrations;
3) Field days; and
4) Manure management publications.

Projected Outcomes:

1) Increase in number of land managers who base manure and fertilizer decision on soil testing;
2) Reduction of nitrate contamination; and

3) AFOs that want to implement a CNMP by 2009 and will do so.

Year Three Results
Key Themes - Agricultural Waste Management, Soil Quality

Increasing Wise Use Of Soil Management
--Agricultural producers/land managers who participated in educational programs reported they base salinity-management decisions on soil-testing results in 14 out of 62 instances.

--To encourage the adoption of soil testing prior to fertilizer application on the Western Slope, a state soil specialist, and area Extension director and a local cooperator initiated an on-going study of corn fertilization. Prior to the initiation of the test, the local cooperator would apply 130 pounds per acre of nitrogen to reach his production goal. With soil testing, he reduced this application of nitrogen fertilizer to 70 pounds per acre for a cost savings of $23,80 per acre, or a total savings of $10,710 in fertilizer input for the corn acreage this producer manages. He reported that the yield was excellent, and the results of this test were used in winter seminars and workshops throughout 2002 to reinforce the impact wise soil testing as a management practice.

Linkages: CSU departments of Soil and Crop Sciences, Bioagricultural Science and Pest Management and Food Science and Human Nutrition, CSU Master Gardener Program; Colorado Department of Agriculture, Colorado Department of Health and Environment, crop consultant groups, Natural Resources Conservation Service, and green industry leaders and producers.

Source of Federal Funds: Smith-Lever, Hatch

Scope of Impact: State Specific

Integrated Cooperative Extension/Agricultural Experiment Station Programs:
Ongoing research project (#685) to determine manured crop land evidence of salinity levels, nitrate leaching, and pest populations provides information for Extension educators on helping producers manage nutrient applications.
Resources from CE: .3 FTE.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	1.5	1	2	3	3	1,110,337
County FTE	2.5	2	3	4	5	1,339,643
Total FTE	4.0	3	5	7	8	2,449,980
Budget	336,205	139,312	422,755	595,857	672,408	

Objective IV.D: Enhance adoption of research-based management practices in the green industry of Colorado.

Since 1990 the annual population growth in Colorado has averaged 3.1%. By 2010, the Colorado population is estimated to grow to 4,892,567 with 79% in urban settings. As determined by the 1993 GreenCo industry survey, the average household in Colorado has an annual expenditure for horticulture-related products and services of $1000. The demand for information from both the commercial and home horticulture segments has increased accordingly.

New residents find their plant-growing experiences don't always apply to Colorado's high-altitude, pests, available water supplies and other environmental conditions. Pest Management is a major concern to green industry businesses and goes hand in hand with growth related problems.

The biology of selected horticultural pests and potentially damaging new pests is poorly understood and requires further investigation to develop effective management recommendations. Evolving social and environmental concerns present pest management challenges particularly where pesticide resistance has developed or available pesticides have changed. Environmental and ecological concerns on the minds of Coloradans include chemical and pesticide use and disposal, waste management practices, weather and climate effects on plants, and a desire to see ecologically sensitive approaches to natural resource and land use. Information needed to allow residents to grow plants more successfully while going easy on the environment is a priority of Coloradans.

Colorado's horticultural industry has grown in response to the demand posed by general growth in the state. The sales value of various horticultural industry segments, based on 1993 data, are: green industry including turf-related--$1.37 billion, greenhouse--$170 M, commercial vegetable--$130 M and commercial fruit--$20 M. The Colorado Green Industry payroll exceeds $555 million paid to more than 25,500 employees in Colorado. This represents about 25% of all Agriculture in the State of Colorado.

Growth has triggered changes for both horticultural consumers and the state's green industry. Consumers are presented with more plant and hard goods choices, a greater selection of suppliers, increased sources for horticultural information and changes in the technology of information delivery. The green industry is faced with more demanding and increased numbers of customers, increased competition, changes in economy and changes in social and regulatory climate.

Turf Industry

Turf production and management at all levels, both lay and professional, requires inputs of water, fertilizer, pesticides, and energy. Improper management decisions can be expensive and may negatively impact air, soil, and water quality. *Turf Production and Management in Colorado* addresses issues in two areas: sustainable turfgrass management and turfgrass water conservation. Sustainable turfgrass management seeks to identify methods that will help all producers and managers of turf, both lay and professional, to produce aesthetically pleasing, functionally safe, economically viable, and environmentally friendly turfgrass. It integrates all elements of management –water, pesticides, fertilizers, wastes, energy, economics, etc – into systems which can easily and economically be used at all levels of turfgrass production and management. Sustainable turfgrass management involves strategies which help the turf manager to select species and varieties, cultural practices, and pest management approaches which reduce costs of purchased inputs, minimize the impact of the system on the immediate and off-site environment, and provide a sustained level of quality and/or profit from turf management. The production and

management of turf in the state of Colorado requires some level of irrigation during the establishment and subsequent culture of that turf. The manner in which this is done ultimately affects turf quality, but also has potential ramifications for water and soil quality and may create important economic problems for the water user.

Master Gardeners

Colorado Master Gardeners are both a target audience and a delivery means to the broader public. Community impact expands as staff empower Master Gardeners to become proactive in their own circle of influence. Seventeen percent of the Master Gardeners are employed in the Green industry. Basic training for CMG volunteers includes a standardized, state-sponsored curriculum with 60 hours of classroom instruction taught by county staff, state specialists, and other local horticultural experts. Some county programs add additional instruction on topics of local interest. In addition, local programs are expected to offer a variety of continuing education opportunities.

Projected Outputs:

Educational materials, including,
1) Computer graphic slides;
2) Green Scene Newsletter;
3) PlantTalk Colorado message scripts;
4) Introductory level school at the Annual ProGreen Conference; and
5) Master Gardening Training..

Projected Outcomes*:*

1) Increased utilization by green industry members of CSU Extension research-based best management practice recommendations;
2) Increased utilization of PlantTalk Colorado by members of the industry and their customers.
3) Green industry employees will increase collaborative behavior, increase their knowledge on a wide range of topics and pass on information to the gardening public.

Collaboration-Building Indicators:

1) Appearance of partners logos on joint program flyers;
2) Formation of a joint program planning group;
3) Joint moneys into program and a sharing of program money proceeds;
4) Information distributed in partners newsletters; and
5) Programs jointly taught.

Year Three Results

Key Themes - Other: Urban Horticulture, Master Gardeners, Adult Education, Green Industry

--In 2000, 1500 Master Gardener volunteers donated 53,000 hours in service, making 90,000 one-on-one contacts (plus contacts with groups and media).

A breakdown of outreach efforts (by volunteer hours) includes the following:

44% One-on-one office, phone and field contacts
20% Mass contacts at information booths: clinics at garden centers, garden shows, fairs
11% Group contacts through classes and workshops
12% Community gardening and greening activities
3% Media: newspapers, TV, radio, and web
10% Program management

--Of 1,159 horticultural contacts made in one area, 296 of those resulted in strengthened partnerships, cooperative endeavors and/or collaborative efforts with public and private horticultural industries and organizations, including 39 non-profit agencies or organizations, 25 for-profit organizations or businesses, 19 public or government agencies, and 4 other organizations.

--Cooperative Extension horticulture staff developed 18 new technology-related training materials for use by green industry professionals. Educational materials on horticultural topics were accessed 6,716 times from a variety of sources. At educational or technical assistance events, 1,730 green industry groups or individuals were present.

--Of the 2,030 green industry professionals reporting increased knowledge about horticultural issues and related educational topics, 120 cited pest management and control, 67 indicated weed management and control, and 704 said they would adopt research-based best management practices for horticultural decisions.

-- The Extension *Horticulture and the Green Industry* program supports Colorado's every-growing green industry. In addition to training Master Gardeners, the project provides exactly the same information to green industry professionals and members of the general public. Training materials are developed by Cooperative Extension and the Green Industry working in collaboration and are delivered in a variety settings including ProGreen Expo, Turf and Landscape Field Day, Horticulture Short Courses, Plant*talk* Colorado, Turf Conference, Colorado Garden and Home Show, and through fact sheets, technical bulletins, the Green Scene Newsletter, and by invited presentations.

--Research has shown that grass clippings effectively return nutrients to turfgrass soils, reduce nitrogen fertilizer requirements by 30%-50% and does not affect thatch accumulation. Other research at Colorado State University found that polyacrylamide gels as soil amendments do not reduce turfgrass water use or irrigation requirements and therefore are not recommended in golf, sports, or lawn turf care. Soil amendments such as organic matter have proven to be more beneficial. A recent survey revealed that one individual landscaping client saved $25,000 by not using polyacrilamide gels.

--Colorado State University's research on turf grass evaluation has identified mid-Atlantic Kentucky bluegrass cultivars as requiring 10%-20 % less irrigation than other bluegrass varieties. In addition, research has identified rye grass as a recommended for use on golf courses. The impact of these new practices has reduced necessary irrigation and fertilizer application.

--A survey of horticulture and green industry professionals identified ten Colorado weeds that were most commonly identified as problems for homeowners and turfgrass managers. A poster giving information about non-chemical and chemical control recommendations was made available to industry professionals. Available retail weed control products were also included on the poster. A survey of the impact of the poster revealed that 50% of the business posted them in areas accessible to both customers and employees and used them identify weeds for customers. Eighty-four percent of the professionals indicated that the posters were helpful in weed identification, 74% rated it helpful for weed control information, and 65% declared they had changed their weed control recommendations as a result of this information. Overall, recipients

made more thoughtful recommendations increasing the non-chemical control methods recommended and exploring more sophisticated identification of a weed before selecting control measures.

--A Four Corners Weed School planned for four years was initiated in 2002. Patterned after the Master Gardener model, 17 initial participants paid a fee to cover printed materials and an additional fee if they did not wish to participate in volunteer time. Classrooms and field tours were included in the training which was done collaboratively with the weed program supervisor in the county. Volunteers who completed their community service time reported that it was the most important part of the total experience. One participant has already initiated a weed management business and two others are in the process of becoming weed management certified through the Colorado State Department of Agriculture.

Linkages: CSU departments of Horticulture and Landscape Architecture and Bioagricultural Science and Pest Management, Colorado State Forest Service; Colorado Department of Agriculture, Denver Botanical Gardens, Denver Water District, Green Industry Executive Committee, Board, and members, Colorado Garden and Home Show, Colorado GreenCo.

Source of Federal Funds: Smith-Lever

Scope of Impact: State Specific

Integrated Agriculture Experiment Station/Cooperative Extension Integrated Programs:

Ongoing research project (#713) on the selection, introduction and evaluation of landscape materials for the High Plains enables horticulture specialists and agents to make appropriate recommendations to producers. Resources from CE: .2 FTE.

Ongoing research project (#642) on technologies impacting waste water and fertilization needs in greenhouses provides technical recommendations for specialists and agents to share with members of the green industry in Colorado. Resources from CE: .5 FTE.

Turf Production and Management programs in Colorado are cooperative between CE & AES to address issues in two areas: sustainable turfgrass management and turfgrass water conservation.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	3	2.5	4	4.5	4.5	1,882,445
County FTE	10	11	12	12	13	4,439,958
Total FTE	13	13.5	16	16.5	17.5	6,322,403
Budget	765,799	591,351	1,304,8l6	1,353,092	1,429,643	

Objective IV. E. Improve the rangeland management skills of Coloradans who manage public and private land.

Projected Outputs:
1) Grazing management class for producers, agency personnel and environmentalists;
2) Field days; and
3) Educational seminars.

Projected Outcomes:
1) Colorado producers will implement grazing management plans appropriate for their operations;
2) Environmental groups, government wildlife agencies, private land owners, and resource management owners will collaborate to improve grazing management to enhance resource conservation and protection, and wildlife and fishery management;
3) Enhanced watershed hydrological functioning and improved quality of water resulting from better vegetation management practices;
4) Colorado producer adoption of integrated sustainable livestock, rangeland, crop land production systems.

Key Themes - Natural Resources Management, Drought Management

Year Three Results
Key Themes - Natural Resources Management, Drought Management
--Of 4,061 agricultural managers participating, 1,920 improved rangeland management practices to enhance resource conservation and/or wildlife management.

--A total of 2,754 agriculture producers and land managers improved their rangeland management practices in order enhance natural resource conservation and/or wildlife management; 1,312 agricultural producers or land managers reported a reduced crop loss and/or lower production costs due to improved weed, disease, and pest control on 120,315 acres of land. Out of 6,674 participating agriculture producers or land managers, 823 reported the adoption of non-chemical pest management alternatives.

--Of a total of 1,404 participating agriculture producers and land managers, 769 reported that they based fertilizer decisions on soil testing results after extension education.

--The average homeowner in Colorado spends $1,000 annually on yard care plants, gardening supplies and chemicals. Many new residents find their landscape experiences they bring from other environments do not apply to Colorado's weather, high altitude, soil, growing conditions, and water supplies. In a Front Range county a new program has been responsive to these challenges. An Extension Native Plant Masters program focuses horticulture education for sustainable landscapes with native plants and adapted non-invasive, non-native plants that can reduce the need for water, pesticides and overall maintenance.

--Workshops and training are given to Extension Master Gardeners, urban-, foothills- and mountain-homeowners, newly arrived residents, green industry employees, municipal personnel, and public agency staff and personnel. The goal of the program is to increase knowledge about

and practice of small property stewardship with appropriate plant selection, wise landscape, and water conservation. Sixty percent of the participants in these workshops indicate their intention to modify their management practices before resorting to pesticides by careful selection of plants and increased plant diversity. Of those trained, 99% of small acreage owners reported they increased their knowledge of how to maintain and enhance the natural resources they manage.

--A series of rangeland drought management were held in the southeast corner of Colorado in 2002. Extension professionals had observed that the increasing threat of significant drought in the state and planned workshops to assist managers in best management practices. In a five county area, ranchers made herd cut decisions 30-45 days in advanced of the rest of the state. The result was higher prices for their animals and reduced rangeland damage in that part of the state.

Linkages: CSU departments of Rangeland Ecosystems Science, Fishery and Wildlife Biology and Animal Sciences, Integrated Resource Management Team, Cooperative Extension Southeast Regional staff; Colorado Department of Agriculture, Bureau of Land Management, Natural Resource Conservation Service, USDA Forest Service.

Source of Federal Funds: Smith-Lever

Scope of Impact: State Specific

Integrated Agriculture Experiment Station/Cooperative Extension Programs:

An ongoing research project on management of weeds on range and pastureland (#759) provides technology transfer to Extension educators and land managers. The objective of the *Salinity Work in Colorado's Lower Arkansas River Basin* project is to continue detailed data collection at the field scale for soil salinity, depth to groundwater, groundwater quality, rainfall amounts, evapotranspiration, and crop yield in ten fields. The data collected is used to determine the severity of crop losses due to salinity and waterlogging using a Geographic Information Systems (GIS) model developed in conjunction with AES. This information will also be used to provide insights into the fields scale process for a sub-regional project that is ongoing, as well as to evaluate the impact of changes in agricultural practices on crop yields and water quality. Workshops disseminate the results.

The *Southeast Regional Range-Livestock* program addresses management issues for range, grazing, watershed, livestock, and wildlife and endangered species in southeast Colorado.

Resources from CE: .20 FTE.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	1.5	1.5	2	2	3	965,510
County FTE	2	2.5	3	3.5	3.5	1,109,990
Total FTE	3.5	4.0	5	3.5	6.5	2,075,500
Budget	297,929	188,147	422,755	461,031	557,582	

Objective IV.F: Creation of Prairie Dog Management Work Group to develop and implement a program that achieves conservation of the black-tailed prairie dog in Colorado while recognizing that control is necessary and appropriate in areas where prairie dogs conflict with agriculture and other human activities.

Colorado State University Cooperative Extension recently began training small acreage owners in several areas including resolving conflicts with wildlife. Small acreage owners are well educated but generally lack knowledge on how to manage conflicts with wildlife on small acreages. These owners frequently have conflicts with deer, rabbits, voles, prairie dogs, pocket gophers, and several bird species such as flickers.

Wildlife problems cause economic damage and nuisance conflicts in Colorado. Numerous clienteles seek educational information on how to resolve these conflicts. Colorado State University has a network of Master gardeners/Extension volunteers that assist County Extension Agents with answering questions from clientele. We have developed a training program for Extension volunteers that provide educational information on resolving conflicts with wildlife. The training consists of >3 hours of instruction and resource materials which includes a 100-page manual. Resources for the volunteers include an Extension Web-site on managing conflicts with wildlife, which contains numerous resources and links to sites related to resolving conflicts with wildlife. Extension volunteers refer clientele directly to the Web site for information instead of photocopying and sending information.

Projected Outputs:
Comprehensive work plan with specific tasks to accomplish: inventory and monitoring of existing black-tailed prairie dog populations in Colorado, criteria and procedures for identifying potentially unique or high-quality prairie dog colonies for protection, identification of unique prairie dog colonies, identification of incentives for landowners to protect important prairie dog colonies, establishment of a target acreage of occupied prairie dog habitat, and criteria for and identifying unoccupied potential prairie dog habitat in Colorado. Educational information will include 1 hour presentations and Extension bulletins on managing conflicts with about 12 species of wildlife.

Projected Outcomes:
1) Conservation of adequate populations of black-tailed prairie dogs in Colorado to negate their listing by the U.S. Fish and Wildlife Service as a threatened species;
2) Agricultural producers will have greater flexibility in managing prairie dogs where they cause conflicts if they are not listed as a threatened species;
3) More negotiated solutions to human/wildlife conflicts.

Year Three Results
Key Theme: Wildlife Management
--A fact sheet titled *"Managing Prairie Dogs,"* was published this year despite the fact that the specialist leading this group was on sabbatical for six months. The fact sheet contains the following subheadings: biology and social organization, effects on rangeland, economical importance, health risks, black-footed ferrets, effects of extermination, control methods, and regulations.

--Ongoing training for Master Gardeners and other community volunteers continues to assist clients with managing conflicts with wildlife. In 2002, planning meetings were held with the Division of Wildlife to enhance our collaboration on issues related to youth, sport fishing, wildlife human interface and shooting sports.

--One hundred and eighty volunteers were trained to assist county offices with wildlife human conflicts. In addition, a Web-site for managing conflicts with wildlife was updated and targeted at small acreage owners and other urban clients. The URL for this page is http://www.colostate.edu/Depts/CoopExt/wildlife/

Linkages: CSU departments of Fishery and Wildlife Biology and Biology; Colorado Farm Bureau, Colorado Cattleman's Association, Colorado Division of Wildlife, Colorado Department of Agriculture, Colorado Department of Public Health and Environment, Colorado State Soil Conservation Board, Colorado State Board of Land Commissioners, USDA/APHIS Wildlife Services, U.S. Bureau of Land Management, U.S. Department of Defense, U.S. Environmental Protection Agency, USDA Farm Services Administration, U.S. Fish and Wildlife Service, and U.S. Forest Service.

Source of Federal Funds: Smith-Lever

Scope of Impact: State Specific

Resources Allocated:

	2000-01	2001-02	2002-03	$ Equivalent
State FTE	.2	.2	.3	67,585
County FTE	.3	.8	1.2	176,066
Total FTE	.5	1.0	1.5	243,651
Budget	42,275	44,519	120,826	

Goal IV. G. Enhance the adoption of drought mitigation practices and increase drought planning for community, agricultural and natural resource land managers.

The year 2002 was marked by the most severe drought in Colorado in 100 years. Cooperative Extension created a Drought Task Force which began meeting in the winter of 2002 and identified critical needs, a website for Cooperative Extension materials was designed (URL is http://www.ext.colostate.edu/drought/fsmenu.html) and a second website was designed for the university's main web page. (URL is http://drought.colostate.edu/) Regular drought recommendations and information were provided on a weekly basis. In addition, educational materials were produced in the form of newsletters on consumers' reaction to the drought, and a notebook of drought related information was sent to all county offices. A survey was initiated by CSU researchers to learn how producers were coping with decision making during drought. Recommendations were revised in areas of cropping production, livestock health and stocking,

destocking, and restocking, alternative feeds, and recommendations in the landscaping industry.

A critical collaboration with the green industry proved extremely important in this time of drought. Faculty members from Cooperative Extension met with leaders of the green industry and jointly began producing materials for consumers and water managers to assist in decisions about landscaping material, irrigation or watering schedules, and watering priorities. A number of CSU faculty worked actively with water managers and provided information on the implications and impacts of water manager decisions. Many communities immediately went into water rationing and many tools for moving, leasing, and selling water were investigated. CSU extension faculty played a critical role in testifying before regulatory groups and community decision-making groups. Regular press releases included recommendations for watering, how to conserve water within households, and what best management practices assisted in water conservation in agriculture.

Critical community reactions occurred when some agriculture producers sold their water to urban users which offered high prices. Critical decisions on when to plant and what to plant were facilitated by workshops and communication with Cooperative Extension faculty. Since the Federal crop insurance program has been constructed to respond to emergency around floods, its current language and regulations are not helpful in a drought environment. We met with representatives of the Federal Insurance Corporation and NRCS and other land and conservation management agencies. As a result of the conversation we agreed on a clarification of the role of county and state faculty and recommended Colorado's involvement in a new national committee developing revisions in the federal crop insurance plan. Many county faculty played critical roles in providing letters to ranchers and farmers regarding the abandonment of crops in the field. A monthly drought teleconference was initiated so that faculty from throughout the state could report on conditions in their area and request materials and support from state faculty. Cooperative Extension faculty participated in the Governor's Water Availability Task Force and began daily and weekly reports to irrigators and homeowners on evapotranspiration data to guide watering and irrigation decisions.

Year Three Results

Key Themes – Drought, Natural Resources

--The Ogallala Aquifer Workshop was attended by 130 individuals who responded enthusiastically to the combination of breakout and plenary sessions. Evaluations on a scale of 1 to 4 (with 4 as a high) showed that the most valuable workshop was on hydrology of the aquifer. The second most important and well received was an update on litigation with water rights and wells, and the third was on the science of limited water management. All of these evaluations were above 3.1. Multiple responses complimented the six county and regional faculty who organized this daylong event for the combination of science based information coupled with political discussions by elected officials in attendance.

--Ongoing irrigation education with producers is important for coping and decision making around the continuing drought in Colorado. In December of 2002, a limited irrigation strategies workshop for sunflowers was held in three different locations in Eastern Colorado. The attendees at this workshop manage a total of 27,580 acres of sunflowers. Eighty-three percent of the attendees indicated that they plan to make changes in their production techniques as a result of this meeting. Their estimation of the dollars to be saved by making these changes in best management practices were $20.89 per acre for a total saving of $565,370.

Agriculture Experiment Station/Cooperative Extension Integrated Programs:

Colorado State University Cooperative Extension's Colorado Drought Mitigation and Management Education project has reallocated significant human resources at the county and state level in response to the information and educational needs of Colorado citizens during this drought. An Extension Drought Response Team was created to support CE field staff efforts dealing with drought and to enhance communication and coordination within CSU and with partner agencies. This team supported a high visibility web site that provides information to help various clientele groups deal with the drought. Strategic planning has resulted in identification of outreach priorities and objectives. Monthly teleconference calls on drought conditions and programs are held to provide updates to staff and coordinate program efforts. CSU faculty serve on the Governor's Water Availability Task Force to enhance interagency coordination.

Adequate supplies of clean water are essential to the health and well being of Colorado citizens, agriculture, industry, wildlife and the economic vitality of the State. *Colorado Water Outreach Program* provides research-based information and educational programs on water quality, water quantity, water policy, and natural resource issues related to water use. A team of specialists from campus and the regions are working together and address issues such as agricultural chemicals and ground water protection, nonpoint-source pollution information and education, and selenium.

Southeast Colorado Water Management uses the theme "Stretching Our Water" for demonstration and research on water in southeast Colorado. Demonstration and development of BMPs promote water use that is most cost effective and will improve the quality of the water in the Arkansas River and/or the groundwater basins. These BMPs would also be designed to control and/or reduce erosion and salts in the soils, surface water and groundwater. New and/or alternative crops are explored, as is the use of polyacrylamides to reduce erosion and ditch seepage and to increase water-holding capabilities of the soil. Other technologies are demonstrated as well, including rapid salinity mapping, ionized water, drag-hoses on center-pivot systems, and surface and sub-surface drainage.

GOAL V: Enhanced economic opportunity and quality of life for Americans.

Issue: *For many Coloradans improved quality of life is their most important goal and that potential has attracted many people into the state. Economic opportunities in the tourism industry and the technology related industries also have attracted people. The Extension program challenges, resulting from this rapid and targeted growth, include building community connections and decision-making processes so that change can be planned for. In addition, families need to keep a work and relationship balance which nurtures all members of the family in a rapidly changing environment.*

Young people have many opportunities for recreation and participation in the fast-paced media related world. Yet, the high employment and rapid change creates real deficits in maintaining community social capital, family cohesion, and effective decision-making structures for controversial challenges. Building the capacity of our Extension system to engage in public policy education, focus leadership in key environmental conflicts, and support investments in youth and families will take a deliberate and comprehensive strategic plan.

Colorado Situation Affecting Goal V

Human Population

Reaching 4.3 million residents in 2000, Colorado was the third fastest-growing state (30.6%) in the U.S. and one of eight states growing by more than 1 million residents since 1990. Population and growth in Colorado are not evenly distributed across the state. Eleven of Colorado's 63 counties had populations greater than 100,000 residents in 1998. These eleven Front Range counties experienced an average growth rate of 28.7% from 1990-98. The remaining 52 counties in Colorado had populations of fewer than 45,000 people and their average annual growth rate for the period was 21.8%. Colorado's 16 rural counties (population <5,000) had an average growth rate of 14.8% (Census, 2000). Proximity to population centers increases the likelihood of land conversion from agriculture to more intensive or non-production oriented uses.

Colorado's 66.6 million acres are approximately 41% under federal and state management and 59% under private management. Of the privately owned land, approximately 32 million acres is in agriculture. The remainder is either developed or non-agricultural rural land. If land is to be converted to accommodate our increasing population, it will come from agriculture. One estimate indicates that the amount of Colorado land in urban uses is increasing at a rate of 28,000 acres per year (Obermann et al., 2000). A tight supply of private land in desirable living locations, an increasingly urban population, low returns to agricultural production, strong population growth, unequally distributed personal wealth, infrastructural investment and technological innovation and a generally lax regulatory environment with regard to land use all contribute the incentives to convert Colorado's remaining agricultural lands, perhaps irreversibly, to higher intensity uses. A large pool of disposable income to compensate landowners for land stewardship toward public objectives, federal agricultural policy incentives, a general recession, efforts at local land use planning reform, cultural traditions and outdoor amenity oriented lifestyle choices can act to mitigate and, perhaps, override these incentives. Over the past decade, the net outcome of these forces has generally resulted in more land conversion rather than less. Although those forces remain strong, it appears that there may be sufficient countervailing incentives to slow the rate, if not the total amount, of agricultural land conversion in Colorado in the future.

Ag and Non-ag Income

Colorado is the fifth wealthiest state in the U.S. with an average wage of $31,546 in 1999. Like population growth, the distribution of Colorado's wealth and education is highly unequal. Pitkin County is traditionally among the wealthiest counties in the U.S. ($59,000 aver-age personal income, 1998). The San Luis Valley region of the state has maintained an average income of roughly one-fourth that of Pitkin County for at least a half century ($13,000- 0,000 average personal income, 1998). Front Range in-comes are higher on average than the rest of the state, comprising about 82% of total state income and about 75% of total population. The number and proportion of Coloradans employed in agriculture is slowly declining. In the agriculturally dependent and grassland dominated Eastern Plains, incomes are lower on average (approximately $22,000 average personal income, 1998) than the rest of the state.

Average incomes in the agricultural sector are second lowest (to retail) in the state, indicative of the average returns to agricultural production. The interface between the urban Front Range and the rural Eastern Plains increasingly creates scenarios where the "best and highest use" of agricultural land is in x-urban residential development. In some, formerly rural, markets, average housing prices have out-stripped increases in average personal income by as much as 150% in recent years, indicating that commuting urbanites are entering rural land markets,

building homes, and bidding up land prices in formerly rural areas. Higher average incomes and greater income differentials across sectors or proximal locations tend to increase the pressure to convert lands. The nationwide recession should decrease conversion pressure, but there is reason to believe that Colorado will be relatively insulated from this down cycle. Moreover, historically low lending rates should mitigate the decrease in conversion pressure as personal investment capital becomes increasingly affordable.

State and Local Policy

In part due to the state's current affluence, Coloradans have invested hundreds of millions of dollars toward land preservation over the past decade. Although it can be expected that the public's taste for discretionary spending might tend to wane in a recession, potentially harming public preservation initiatives, the November 2001 election did not bear this out. In 2001 Coloradans granted the statewide Great Outdoors Colorado Land Trust (GOCO) the bonding authority to leverage its funds in investments or the future. At the local level, more than 25 Colorado counties and municipalities have taxed themselves to preserve public attributes of undeveloped or agricultural lands, often in partnership with land trusts. Through the donation or purchase of conservation easements or outright purchase, approximately 660,000 acres of Colorado private lands have been permanently preserved from residential or commercial development in cooperation with some 37 local, state, regional and national land trusts (CCLT in State of Colorado, 2000). Compensating landowners for the public benefits that private land steward-ship provides decreases the pressure to convert land from lower to higher intensity uses. State and local regulatory tools can have a similar effect, but may be politically, culturally or legally contentious. Where public incentives or land use controls are not in place to guide private development to pay for itself, opportunities for subsidized land conversion persist.

Hispanics in the Labor Force

The role of Hispanics in Colorado's rural labor force is fairly significant, especially in agriculture and a few other sectors that rely on large supplies of unskilled workers who are willing to accept seasonal employment (tourism, food processing).

With respect to the labor-intensive agricultural sectors that have a high share of labor costs relative to production expenses and employ large numbers of Hispanic workers, greenhouse/nursery enterprises accounted for 4.7 per- cent of agricultural cash receipts, while vegetables and fruits represented 7.1% and 0.5% of cash receipts, respectively, in 1998. Fruit and vegetable market receipts dropped from 6% of agricultural sales in Colorado in 1992 to 3% in 1997, while nursery sales increased from a negligible amount to almost 5% of receipts. Between 1992 and 1997, farm production employment was up 22% and the agricultural input sector had employment growth of 50% while processing/marketing employment levels declined by 14%. These combined for a 9.5% overall increase in employment in agribusiness sectors between 1992 and 1997. National averages would suggest 75% to 80% of farm production employment is Hispanic, but the agribusiness sector is more homogeneous and white. However, Hispanics are playing an increasingly important role in the food-processing sector.

Labor's share of total agricultural production expenses in Colorado averaged about 5% during the 1990s, but has been increasing in recent years. Compensation to hired laborers increased from $198,162,000 in 1993 to $314,935,000 in 1998 (a 59% increase and including both full-time and hired workers). The presence of Hispanic or Latino farm operators in Colorado is increasing, with 945 of Colorado's 29,500 farms totaling 631,049 acres in 1997 (401 of which had sales over $10,000). This is up from 853 farms with 604,464 acres in 1992 and represents the

largest share of ethnic farm operators. For comparison, 13% of the Colorado population is Hispanic.

Colorado Farm Workers

In 1997, 9,394 farms hired 46,072 farm workers and paid $263,603,000 in payroll. The number of farms hiring workers grew (by 257) as did payroll (by $53,928,000), but the number of workers decreased by 350 workers). In 1997, there was an average of almost five workers per farm, but 744 farms hired more than 10 workers and 3,062 farms hired only one worker. The average paid by a farm for each worker was $5721, but that does not control for workers who were employed by more than one farm or by off-farm employers. Sixty-seven percent, or 30,840 of the workers, worked less than 150 days, denoting a large share of seasonal workers, but this number and share are down from 1992 (Census of Agriculture).

According to the Census of Agriculture, the average earnings for a farm worker were $5,722 for work performed in Colorado. However, this varies greatly based on the nature of the work. For farms where workers are only employed for 150 days or more (less than 20% of farms), average earnings were $13,209, whereas those farms that hired only seasonal workers (less than 150 days) paid workers an average of $1,501. For farms where both types of workers were employed, average earnings were close to the overall average at $6,560. Producers note that worker recruitment depends on wages and working conditions: Latino immigrants are satisfied with $6 to $7 an hour, while local workers expect $10 an hour. Some growers have upgraded housing for migrants, but none requested help from the local Employment Service to recruit U.S. workers or approve the entry of H-2A workers. In the western U.S., most H-2A farm workers (a special guest worker program for those sectors that can prove a limited supply of workers) are involved in the sheep industry--a total 1,741 job openings in the sheep industry were certified in 1996, including about 450 in California, 300 in Wyoming and Idaho, and 200 in Colorado and Utah. Nationally, it is estimated that 77% of farm workers were born in Mexico. The National Agricultural Worker Survey's (NAWS) March 2000 data suggests that 45% of the region's farm workers are working illegally in the U.S. and 28% are U.S. citizens. Fifty-six percent of U.S. seasonal farm workers are migrant, but Colorado's share of migrant workers in the total farm workforce ranges from 6% to 14% and it is clear that a larger percentage of the seasonal workforce is migrant.

Rural Economies and Communities

Outside of agriculture, there also is some evidence that Hispanics play a significant role in labor markets. The *Los Angeles Times* (January 11, 1998) ran several stories on resort cities (Vail, Colorado) that are so expensive that most of the people working there (increasingly Hispanic immigrants) cannot afford to live locally. Jobs are plentiful but workers must either commute or hold several jobs to afford to live in the city. The owners of the Vail and Beaver Creek ski areas, which have a peak winter work force of 4,500 and a labor force of 1,200, have gone so far as to build apartments for their workers. Most service workers sleep four or six to an apartment and pay $1,500 or more in rent.

Rural schools in Colorado bear the brunt of large-scale immigrant settlement with the least amount of financial resources to deal with soaring costs (FAIR). A majority of the student population increase in rural areas is comprised of immigrants who speak little or no English. The number of Spanish-only speaking students, drawn to rural areas due to the booming cattle industry, multiplied five times between 1995 and 2000. The schools are unprepared, in terms of Spanish-language materials and the availability of bilingual teachers, to offer English as a second-

language instruction. (Source: EFE news service in *Hispanicvista,* May 23, 2000). The significance and growth in Hispanic population varies greatly across counties. It should be noted that a majority of the top counties with respect to share of Hispanics have a heavy reliance on agriculture in terms of employment and/or income. Another set (Lake, Eagle and Chaffee) is likely influenced by the growth in Hispanic employment in the ski resort industry. The 2000 census data on the foreign-born is not due to be released until late 2002; however, a census supplemental survey estimates the foreign-born population at 368,864. That is 8.8% of the state's estimated overall population (4,198,307) and an increase of 159% above 1990 levels. Colorado ranked 16th nationally in the rate of foreign-born change between 1960-2000. It is estimated that 55% of Colorado's foreign-born population arrived in the state since 1990. Between 1990 and 2000, the share of non-English speakers in Colorado increased by more than one-third, from 10.5% to 14.3%. Past evidence suggests that agriculture often is the first employer for newly entering Hispanic immigrants.

Future Growth

A strong U.S. economy will continue to provide industrial growth rates in Colorado above the national average. A strong demand for second homes and quality of life aesthetic desires will continue to fuel a construction boom and the establishment of more part-time residents. Colorado is viewed as a desirable retirement location for the tremendous number of baby boomers approaching retirement.

Growth in Colorado needs to be differentiated by region to reflect the diverse growth dynamic at work. The Front Range will see continued industrial growth as well as more retirees. The mountains and West Slope will see second home growth in tourist areas; the warmer parts of this region will see more retirees. The Eastern Plains and San Luis Valley will enjoy some spillover growth from the Front Range as well as increased public sector growth (i.e., prisons). Agriculture will continue to be a strong but struggling presence. Thus growth will be viewed as a positive or negative depending on the region of the state and how well the state deals with growth.

Growth in Colorado is largely determined by economic decisions by private sector industry and decisions by individuals about where to live. These factors are somewhat beyond the ability of the state government to influence. What the state can do and is currently debating is to determine how to manage and direct this growth. If this is not accomplished by the legislature in a satisfactory way, there is a likelihood of the citizen initiative process addressing the issue.

Continued growth in Colorado must be assumed regardless of how the state handles it. Given this reality, Colorado State University and Cooperative Extension must determine what role they can play in an educational context. Obviously some long standing Extension programs (i.e., Youth, Consumer Sciences and Family Living, Horticulture) can expand their programming base in keeping with population increase as resources permit. In addition, they can introduce new subject matter and approaches to address changing demographics and issues. Extension agriculture programs will need to be refocused to address an industry that is being confronted with new environmental laws, changes in traditional land uses, transfers of water out of agriculture, as well as maintain programs to sustain agricultural productivity. Extension Natural Resource programs will have new challenges to address as the urban/wildland interface shifts and expands, there is a proliferation of small-acreage land managers, and commercial land managers seeking alternative revenue sources.

The challenge for Colorado State University and Cooperative Extension on the growth issue is to recognize our strengths and weaknesses as we fashion a role for us in addressing growth decisions in Colorado. Our strengths continue to be 1) our statewide network of Extension

educators linked to the resources of the land-grant university; 2) our ability to respond to emerging issues of statewide importance; 3) our subject matter programs (youth, family and consumer sciences, agriculture, and natural resources) which are appropriate for new Colorado residents. Our weaknesses include: 1) a budget that is not keeping pace with population increases and the specialized needs of new issues growth presents; 2) a lack of capacity and experience in some growth topics-urban planning, land use; and 3) limited capacity for effective facilitation of public policy issues.

New Program Team

The *Addressing Growth Decisions Program Team* (ADG) (co-chaired by Andy Seidl and Lloyd Walker) has four Action Committees:

--Natural Resources, Del Benson, chair
--Water, Reagan Waskom, chair
--Policy, Andy Seidl, chair
--Small Acreage, Bob Hamblen & Lori Warren, co-chairs

This Action Committee structure represents a focus on the agriculture and natural resource component of growth. However, recognizing that growth incorporates other topics, the ADG Program has collaborative links with other program teams also addressing growth (i.e., Work Force/Labor Force, Sustaining Agriculture and the Environment, Engaging Communities in Transition). Links will be established with other teams as needed and appropriate.

As an educational strategy, action committees operate independently based on their subject matter with links and coordination provided by the team co-chairs and team executive committee (co-chairs and action committee chairs). The co-chairs work with other program teams as appropriate. This strategy is to acknowledge the diversity of topics on the growth issue and the related but somewhat eclectic composition of our team. This strategy also reflects our budget limitations. With few resources devoted directly to "growth," our team has to tap existing resources and programs that have a growth element.

Goal V Overview and Outcomes

Objective V.A: To integrate the Youth as Assets framework into all youth development programs with an emphasis on developing life-long skills.

Projected Outputs:
1) Newsletter articles clarifying the assets model for 4-H leaders and other youth professionals;
2) Development of materials and in-service experiential learning opportunities for 4-H youth faculty, other youth volunteers, and professionals

Projected Outcomes:
1) 4-H youth leaders and other youth professionals will begin to integrate youth as asset language into their planning and programming activities;
2) Youth can name positive assets which create resiliency and encourage positive contributing behaviors;
3) Youth take more responsible leadership positions within their own organizations;
4) Youth initiate plans for community service and identify leadership opportunities for themselves and others in their community.

Year Three Results

Key Themes – Youth Development, Character/Ethics Education, 4-H

--Service learning projects help participants gain skill and experience through active participation in organized service experiences that meet actual community needs. Of the 9,648 participants in service learning projects, 7,854 helped identify opportunities to meet actual community needs.

--Participants interacted with interested adults to implement a project in 5,575 instances. When asked if their experience made a difference in one's own life or the lives of others, 1,672 out of 2,726 total participants said "yes."

--Participants made use of personal talents and skills in 2,256 of 2,728 cases.

--Youth voluntarily identified a mutual goal, and shared responsibility for accomplishing the goal in 3,127 of 3,835 cases.When participating in a project, 8,674 of 9,016 participants shared accomplishment and achievements with others.

--Participants developed thinking and managing skills like problem solving, including identifying a problem and developing a plan of action to resolve it. In problem-solving situations, 13,079 of 13,473 were able to carry out a plan of action to resolve a problem.

--In decision making situations, 16,209 of 17,058 participants were able to compare and choose among several alternatives due to increased decision-making skills.

--Participants in critical thinking exercises were able to observe and examine reactions of others in 22,930 out of 22,948 cases.
--In events to exercise goal setting and planning and organizing skills, 4,040 of 4,660 participants

identified a goal to work toward, and recorded and shared achievements towards that goal. The ability to plan and conduct an event/activity were reported or documented for 5,531 out of 6,979 participants.

Objective V.B. To enhance the quality of the contributions made to Colorado Cooperative Extension by a well-educated, effective volunteer network.

Volunteers play a dynamic and integral role in delivering Cooperative Extension programs through participation in 4-H, Master Gardeners, Rural Assistance, Expanded Food Nutrition Education Program, Food Nutrition Program, county or program advisory committees, commodity groups and many other positions. The role of volunteer development in Cooperative Extension programs is to build organizational capacity through the most cost-effective way of reaching more people, more quickly, with relevant information. The organization could improve the impact of volunteers in program planning, delivery and evaluation through a systematic, organizational approach to addressing this vital function through enhancements to staff development, policy development, and program management.

Projected Outputs:
1) Improved efforts at volunteer identification, selection, orientation, training, utilization, recognition, evaluation and retention;
2) Improved through planned extension educational orientation, preparation, training, and assistance activities;
3) Volunteers will become more involved in neighborhoods, community partnerships and community affairs, and will develop skills to enable effective partnerships and collaborations;
4) Volunteers will assist CE personnel in meeting their goals through facilitation and leadership efforts, and use of personal influence and collaboration skills to add value to CE programs.

Projected Outcomes*:*
1) Reduced volunteer turnover;
2) Increased volunteer tenure;
3) Improved program delivery;
4) Volunteers have the skills for the position they are seeking;
5) Improved understanding of the potential volunteers' attitudes and motivations for involvement;
6) Improved communications between staff and volunteers;
7) Improved assessment of the training needs for volunteers;
8) Improved match between volunteers and CE programs;
9) Decrease volunteer dropout rate;
10) Increase volunteer satisfaction in accomplishing program goals;
11) Clarification of the roles and responsibilities between volunteers and CE;
12) Rights of volunteers protected;
13) Rights of CE protected.

Year Three Results
Key Themes - Volunteer Development
--Extension personnel will design opportunities and creative roles for volunteers. *Number of volunteer opportunities and creative roles designed: 874*

--Extension personnel will recruit new volunteers for these opportunities and roles. *Number of new volunteers recruited: 592*

--Extension personnel will match roles/positions with volunteer abilities/skills. *Number of volunteer roles/positions matched with volunteer abilities/skills: 469*

--Extension personnel will report an increase in retention of volunteers. *Number of volunteers retained/total number of volunteers: 1,877*

--Volunteers will increase their problem-solving skills and enhance their ability to solve problems. *Number of volunteers who increased their problem-solving skills and/or enhanced their ability to solve problem/total number of volunteers trained in problem solving: 2,974.*

--Volunteers will show evidence of accepting differences in people and their opinions, will tolerate disagreements, will demonstrate conflict negotiation skills, and will manage conflict positively. *Number of volunteers who showed evidence of accepting differences in people and their opinions, who tolerated disagreements, who demonstrated conflict negotiation skills, and who managed conflict positively/total number of volunteers trained in conflict resolution and management: 674*

--Volunteers will increase their knowledge and/or skills related to leadership. *Number of volunteers who increased knowledge and/or skills related to leadership/total number of volunteers trained in leadership skills: 1,949*

--Volunteers will report they learned skills that contributed to enhancement of their career or life's work. *Number of volunteers who reported they learned skills that contributed to enhancement of their career or life's work/total number of volunteers trained: 7*

--Volunteers will report improved quality of their volunteer educational experience. *Number of volunteers who reported improved quality of their volunteer educational experience/total number of volunteers: 591*

--Volunteers will report they were engaged in meaningful volunteer activities/roles, and report increased volunteer satisfaction. *Number of volunteers who reported they were engaged in meaningful volunteer activities/roles, and reported increased volunteer satisfaction/total number of volunteers: 345*

--Volunteers will increase their knowledge about building teams, partnerships and collaborations. *Number of volunteers who increased their knowledge about building teams, partnerships and collaborations/total number of volunteers trained in team-building and collaboration: 418*

--Volunteers will report they became involved and made use of personal talents and skills to enhance or strengthen neighborhoods or communities, or to solve neighborhood or community problems. *Number of volunteers who reported they became involved and made use of personal talents and skills to enhance or strengthen neighborhoods or communities, or to solve neighborhood or community problems: 785*

--Volunteers will report that their efforts made a difference in their own life or the lives of others. *Number of volunteers who reported that their efforts made a difference in their own life or the lives of others: 1,024*

--Community partnerships will expand due to Extension-trained volunteer efforts. *Number of community partnerships created/expanded due to Extension-trained volunteer efforts: 5*

--Volunteers/leaders will generate resources for Extension programs, including donated time, money, and/or human capital. *Number of volunteers/leaders who generated resources for Extension programs, including donated time, money, and/or human capital: 1,979*

--Volunteers/leaders will demonstrate outstanding "multiplier effects" for Extension programs. *Number of volunteers/leaders who demonstrated outstanding "multiplier effects" for Extension Programs: 346*

--Volunteers/leaders will demonstrate outstanding personal leadership skills and provide commendable leadership to Extension programs. *Number of volunteers/leaders who demonstrated outstanding personal leadership skills and provided commendable leadership to Extension programs: 734*

Linkages: 4-H Youth Development, CSU departments of Human Development and Family Studies, Social Work and School of Education; CSU Family-Youth Institute; Colorado Trust, Colorado State Department of Education, and Assets for Colorado Youth, Search Institute (Minnesota).

Source of Funds: Extramural and Smith Lever

Scope of Impact: State Specific

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	.5*	.5*	1	2	2	482,755
County FTE	2	3	3	4	4	1,224,816
Total FTE	2.5	3.5	4	6	6	1,707,571
Budget	153,102	152,942	326,204	499,306	499,306	

** Extramural funding*

Objective V.C: Enhance the ability of Colorado parents to control their own anger and react with appropriate guidance to their young persons.

Ninety-seven percent of all male hard-core delinquents have a history of severe physical punishment in the home (Colorado Department of Corrections, 1995). The amount of physical punishment experienced as a child is positively associated with the rate of abusive violence against one's own children. Child abuse has become a national and state problem of epidemic proportions. Nationally, more than 2.9 million reports are made annually. (References are available upon request from Robert J. Fetsch, Department of Human Development & Family Studies, Colorado State University, Fort Collins, CO 80523-1570.) In Colorado, there were 50,940 reports of child abuse and/or neglect in 1997 (K. C. Robbie, personal communication, August 5, 1998 via Central Registry for Child Protection and County Quarterly Surveys CPS Summary 97). This is up from more than 34,000 reports in 1992. Counties most at risk of high child abuse and/or neglect per capita rates in 1997 were: Morgan, Washington, Lake, Bent, Saguache, Logan, LaPlata, Mesa, Adams, Otero, Sedgwick, Grand, Clear Creek, Denver, and Montezuma.

Preventing child abuse is second only to rising health care costs on the list of priorities of the people of Colorado. We know from the research literature that parents who abuse their children have been found to be less knowledgeable about parenting and child development, to have unrealistic expectations of their children, and to use discipline techniques that are inappropriate for their children's level of development. When parents do not know how to react to a child's behavior or when they react primarily in anger, they are at greater risk of abusive behavior. We also know there has been limited research on child abuse prevention programs.

Projected Outputs:
1) Trainer of trainers program for RETHINK;
2) Ongoing research updates and reviews for county faculty;
3) Adaptation of RETHINK for specialized targeted audiences.

Projected Outcomes*:*
1) Parents and youth will report reduction in anger levels and expression of physical or psychological violence;
2) Increase in parent use of appropriate developmental guidance techniques;
3) Pro-active community requests for anger management for adolescents and parents.

Year Three Results

Key Themes - Conflict Management, Parenting, and Communications Skills
--Families and individuals will gain skills and improve behaviors related to nurturing and caring for self and/or children. *Number of families, individuals who improved behaviors related to nurturing and caring for self and/or children 1109 of 1993 participants.*

--Families or individuals will improve attitudes related to nurturing and caring for self and/or children. *Number of families, individuals who improved attitudes related to nurturing and caring for self 4391 of 1355 participants.*

--Families or individuals will increase their knowledge of parenting skills. *Number of families,*

individuals who increased knowledge of parenting skills, 10969 of 12206 participants.

--Families or individuals will increase their knowledge of child growth and development. *Number of families, individuals who increased knowledge of child growth and development 12095 of 13350 participants.*

--Families or individuals plan to make positive behavior changes in nurturing children; *1133 of 1488 participants.*

--Families or individuals gained more realistic expectations of children. *1472 of 1742 participants.*

--Families and individuals improved skills and behaviors in communicating, resolving conflicts, and making effective decisions.

Families or individuals will use better communication skills: *932 of 1491 participants*.
Families or individuals will improve conflict resolution skills: *569 of 1100 participants*.
Families or individuals will increase anger management skills: *107 of 217 participants.*
Families or individuals will reduce anger levels: *104 of 190 participants.*

--Out of 5,735 participants in nurturing and caring for self and or children, 5,169 individuals reported an improvement in these behaviors; 12,114 individuals reported an increase in their knowledge of parenting out of a total participation base of 12,450. Out of 2,419 participants, 1,810 made positive behavioral changes in nurturing their children. Out of 8,920 participants, 8,162 gained more realistic understanding of developmental stages in their children. Out of 1,524 participants, 900 individuals reported an improvement in their conflict resolution skills. Out of 1,187 participants, 785 reported an increase in their anger management skills.

--Twenty-six extension personnel facilitated local conversations regarding public issues which affect children, youth, and families at the community level. Twenty-two extension personnel conducted leadership training for agency and community contacts who work with children, youth, and families.

--Cooperative Extension staff became involved in 56 different collaborations relating to welfare to work job training, school to work, and other workforce preparation programs.

--Seventeen Extension staff incorporated the SCANS Foundation Skills and Workplace Competencies into 16 programs for youth and adults.

Linkages: CSU departments of Human Development and Family Studies, Sociology, Social Work and Health and Exercise Science; CSU Family and Youth Institute, CSU Service Learning Program, 4-H Youth Development, CSU School of Education; Colorado Attorney General's office, Colorado Governor's office, Colorado Department of Education, Colorado Department of Social Services, Colorado Community Policing Institute, Colorado Department of Public Health--Division of Intervention and Prevention for Children and Youth, Build A Generation Program-Office of Juvenile Justice Programs, Colorado Community Restorative Justice Forum-Colorado Department of Justice; Alcohol and Drug Abuse Division-Department of Human Services, Rocky Mountain Center for Health Promotion and Education-Prevention Project.

Source of Federal Funds: Smith-Lever

Scope of Impact: Multi-State with Arizona, California, Colorado, Illinois, Indiana, Kansas, Michigan, Missouri, Montana, North Dakota, Nebraska, Nevada, Ohio, South Dakota, Utah, Washington, and Wyoming.

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	1	1.5	1.5	2	2	772,408
County FTE	3	4	4	5	5	1,607,571
Total FTE	4	5.5	5.5	7	7	2,379,979
Budget	326,204	250,611	451,031	575,858	575,858	

Objective V.D: Enhance the ability of Colorado communities and citizens to prevent youth violence.

At the beginning of 1990s some predicted a plague of violence caused by juveniles, the nation now faces quite a different picture. As reported in the *1999 National Report on Juvenile Offenders and Victims*, the nation experienced its fifth consecutive year of a drop in the rate of juvenile arrest for violent offenses and the rate for youth victimization has followed the same trend. Although the level of youth violence has declined, other statistics from the Bureau of Justice Statistics indicates the continuing seriousness of this issue:

--Young people (between the ages of 12 -24) make up less than a quarter of the U.S. population of 12 and older but experience nearly half of all serious violent crimes.

--U.S. youth homicide rates far exceed those experienced by other industrialized nations; negative social indicators impacting crime also remain high.

--Graduation rates for young adults has remained relatively stable (86%), however, high school completion levels were consistently lower for Hispanics (between 1972 and 1996 fluctuated between 56% and 67%).

--The prevalence of heavy drinking among adolescents has remained constant.

--Drug use among 12th graders had declined in the 1980's, since 1992, illicit drug use has increased among this age group.

--With a few exceptions urban and rural youth reported participation in problem behaviors in equal proportion.

--Research finding from OJJDP and the National Institute of Justice suggest that youth gangs continue to present a serious threat to public safety, despite the recent downturn in juvenile crime. Gang problems now affect more jurisdictions than before, including rural and suburban areas. Gang demographics are changing as gangs emerge in new areas. White participation in gangs is on the rise. The proportion of female gang members, while small, may be increasing.

--Youth who are involved in youth gangs commit three to seven times as many delinquent and criminal offenses as youth who are not gang involved.

--Youth involved in gangs often have long-term mental heath needs requiring long-term comprehensive, and collaborative services in the community.

The nature and characteristic of crime and violence affecting communities continues to change. It is difficult to separate the myth from the reality due to media coverage of recent acts of violence that have occurred in schools/communities across the nation. Colorado communities, whether urban, suburban or rural, are facing these same serious issues.

Colorado communities also face changing demographics adding to the complexity of addressing crime. Some communities are experiencing increases in population, while others struggle to revitalize their communities and keep people from leaving. Several communities have seen increases in immigrants, ethnic groups, and minorities. While all this adds to the diverse nature of communities, it also often results in citizens with varied interests, values and concerns. Individuals and groups isolate themselves to pursue their goals, sometimes in conflict with others or the public good. Communities need assistance in coming together to build consensus around serious public safety issues, to develop strategic plans, and build stronger communities in which crime and disorder will not thrive.

This changing environment has caused law enforcement to seek more effective methods and work together with others in community to develop more strategic and comprehensive approaches to today's challenges of finding solutions to issues such as drug dependency, mental health care, and an every growing population of prison residents. It has not been a traditional role of law enforcement to engage community in resolving these issue, so they also have turned to others that have experience and success in community involvement.

Current research cannot yet say with certainty what combination of programs and social factor lead to decline in crime rates. However, current explanations point to community policing, gun violence prevention programs, gang interventions, school safety efforts, improvement in the economy providing hope for succeeding in a legitimate economy, increased incarceration of potentially violent offenders, and prevention programs, such as mentoring as effective factors in reducing violent crime. The explanations certainly are not mutually exclusive, and different explanation could apply to different communities. Results from a recent study using the *Chicago Youth Development Study* point clearly to the importance of the interaction between family functioning and community characteristics contribution to delinquency prevention. Results indicate that socially organized neighborhoods can mediate the detrimental effects of poor family functioning, while neighborhoods that are the most socially organized can further boost the effect of strong families. Still more research is needed to sort out these and other possible contributors.

Projected Outputs:

1) Development of a resource database to provide youth and family professionals with materials for teaching specific violence prevention skills;
2) Clearly communicated administrative support for the importance of the key strategies to prevent violence in young people and in communities;
3) Skill development training for Extension professionals and youth and family professionals in other organizations on topics such as "Recognizing Vulnerable Youth," "Defusing Anger," "Responsive Communication Techniques," and "Mentoring and Supporting Young People;"
4) Training for communities in the "Community Problem Solving Model" through Partnerships in Community Safety.

Outcomes:

1) Increased active use of violence prevention curricula and experiential learning among 4-H volunteers and youth professionals in Colorado;
2) Development of active problem-solving committees led by youth in selected Colorado schools;
3) Enhanced adult/youth collaborative learning projects;

4) Increased recognition of Cooperative Extension as a violence prevention/youth as assets resource for other organizations; and
5) Increased number of active Extension Partnerships for Community Safety.

Year Three Results

Key Themes - Conflict Management, Other: Violence Prevention

--To assist law enforcement and communities across Colorado in addressing the public safety issues affecting them, a partnership was established between Colorado State University Cooperative Extension (CSUCE), the Colorado Regional Community Policing (CRCPI), and the Neighborhood Resource Center (NRC). CRCPI was created by the Colorado Department of Public Safety, Division of Criminal Justice, in 1997. It is funded by the U.S. Department of Justice, Office of Community Oriented Policing Services, to create a method or process that would assist communities and law enforcement agencies in the implementation of community policing. CRCPI has been successful in providing training, technical assistance, statewide conferences/seminars, publications, and resource materials to law enforcement agencies. To enhance community involvement, CRCPI partnered with NRC to mobilize neighborhoods in the six-county area around Denver. Following the first year of implementation, CRCPI recognized the need to engage rural communities beyond the metro area in applying the principles of community policing. Colorado State University's (CSU) outreach capacity through Cooperative Extension (CE) was recognized by the CRCPI Governing Board. In November of 1998, CSUCE joined this state partnership to begin building new local partnerships that include representatives from law enforcement, schools, youth, non-profits, business, local government, emergency teams, faith community, senior citizens, civic organizations, mental health, public health, social services, hospitals, criminal justice, and other organizations. CSUCE provides community training, support and technical assistance, and a link to University departments and other sources for research of best practices in building community partnerships and addressing specific public safety issues.

--Participants in Extension educational programs will take care to avoid danger, risk or harm; practice self-protection; stay physically and emotionally safe. Youth participants will avoid situations that might put one at risk – weapons, walking alone at night, unsafe food practices, etc. *Number of participants who avoided situations that might put one at risk: 945 of 1,770 participants*. *Number of participants who practiced refusal skills: 489 of 1,277.*

--Participants will practice safe driving and farm safety skills, avoid riding with unsafe drivers. *Number of participants who practiced safe driving and farm safety skills, and avoided riding with unsafe drivers: 872 of 2,194 total participants.*

--Relating and Caring/Cooperation: Participants will work together for a common purpose of mutual benefit. Participants will illustrate trusting relationships through cooperative efforts. *Number of participants who showed respect and consideration for others: 27,538 of 28,043 participants.*

--Social Skills: Participants will behave in an acceptable manner when interacting with others. Participants will show respect and consideration for others. *Number of participants who behaved in acceptable manner: 27,538 of 28,043 participants.*

--Participants will be able to resist negative peer pressure and dangerous situations. *Participants*

who were able to resist negative peer pressure: 1,690 of 2,518 participants.

--Conflict resolution: Participants will apply creative and nondestructive ways to resolved differences with others. Participants will clearly state needs and feelings of others. *Number of participants who applied creative and nondestructive ways to resolve differences with others: 803 of 1,326 participants.*

--Participants will illustrate conflict negotiation skills in confrontational situations. *Number of participants who illustrated conflict negotiation skills in confrontational situations: 1,123 of 1,476 participants.*

--Accepting differences: Participants will recognize and appreciate factors that separate or distinguish one person from another. Participants will value the contributions of a variety of people and treat them with dignity, respect and worth. *Number of participants who value the contributions of a variety of people and treat them with respect: 28,388 of 29,549 participants.*

--Empathy: Participants will be sensitive to another person's situation, feelings, or motives. Participants will identify with and understand another's situation, feelings, and motives. *Number who show empathy to others: 986 of 1,256.*

Economic Impacts of Methamphetamine Production

Increasingly there is evidence that methamphetamine production is occurring in many rural Colorado communities. The chemicals to produce the drugs are readily available in these communities and low populations resulting in few law enforcement professionals mean that it is relatively easy to create a small production lab.

--A Cooperative Extension regional specialist responded to a request from the 13th Judicial District in Colorado to complete a study of the economic costs of methamphetamine use. Twenty-four variables were identified to quantify impacts and a survey was mailed to 159 agencies in a seven county area. Responses indicated that a total of $916,850 in increased expenditures could be attributed to efforts at dealing with the impacts of methamphetamine production and use. The largest increases were for expenditures to address child abuse and neglect, social welfare, and jails and prisons. Many agencies reported that they did not keep records which could identify the specific impact requested by the survey. Extensive media coverage resulted in the publishing of the study, and the data will form the basis of an application for federal funds to assist the judicial district in dealing with the problems associated with methamphetamines.

Linkages: Specialists and faculty in CSU Department of Human Development and Family Studies, county Extension faculty; Colorado Department of Social Services and Colorado Department of Education.

Source of Federal Funds: U.S. Department of Justice, Smith Lever

Scope of Impact: State Specific

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	1	2	2	3	3	1,062,061
County FTE	2	3	4	4	5	1,377,918
Total FTE	3	5	6	7	8	2,439,979
Budget	249,653	236,981	499,306	595,857	672,408	

**Community Policing programming is funded through a grant from the U.S. Department of Justice.*

Objective V.D. Enhance the quality of youth and family serving programs in Colorado and create more supportive policies in areas affecting youth and families.

The Family and Youth Institute is in a unique position to develop and maintain a two-way exchange between the University and community. Across the State of Colorado, many individuals, agencies, organizations, and communities struggle with the issues facing youth, families, and aging populations in our complex and ever-changing society. FYI strives to be the coordinating agency for information dissemination in the family, youth, and aging areas. To successfully coordinate the two-way exchange between CSU and the citizens of Colorado, some specific goals must first be accomplished:

--Profile faculty and develop a faculty database for those on and off campus who are teaching, doing research, working with programs, and interested in family, youth, and aging issues.

--Identify and develop a database of indicators/problems, areas where research is needed in the family, youth, and aging areas.

--Identify programs in the state in family, youth, and aging that have been evaluated, determine the "best-practices" in the different areas, and provide this list on the website.

--Develop a mechanism or model to publicize ongoing research-based information through collaborations, committees, and program development.

--Develop a mechanism or model to translate University interdisciplinary knowledge into real-world interventions.

--Identify and attempt to resolve the barriers to University information and service

--Develop or host training programs for family, youth, and aging organization employees, employers, social service professionals and public officials.

--Provide a strong advocacy for families, youth, and the elderly in policy when necessary.

--Provide research and consultation to executive, legislative, judicial, for-profit, and non-profit agencies on policies that may affect families, youth, and aging populations.

Projected Outputs:
Continued development of the Family and Youth Institute to provide policy education, research collaboration, youth and family professional education, and social and economic analysis of trends affecting Colorado's family and youth.

Projected Outcomes*:*
1) New interdisciplinary collaborations on the Colorado State University campus in research and

programming affecting families and youth;
2) Increased understanding of socio-economic trends and cross-ethic and assimilation challenges affecting youth and families and strategic planning initiated by communities and organizations which reflect these trends;
3) Enhanced skills in developing, implementing, and evaluating appropriate programs for Colorado's families and youth;
4) Increase in external funding to increase institutional capacity for research, policy education and professional development.

Year Three Results

Key Themes - Children, Youth & Families At Risk, Parenting Youth Development/4-H

--Databases of CSU faculty in family and youth research are completed and online.

--Best Practices section of Web-site is completed (see www.cahs.colostate.edu)

--Family and Youth Institute in the year 2002 implemented more fully its management of the gerontology emphasis undergraduate program. In addition, funding was obtained to initiate a campus drug court, the first one to be developed in the nation. The successful implementation of this drug court on campus has resulted in national attention being brought to this work and a number of additional areas of funding are sought to enhance the ability of communities to deal with young people who are abusing drugs and are also in the educational system.

--In addition, the Family and Youth Institute obtained state funding to initiate a comprehensive evaluation of the family centers throughout Colorado. As part of this contract, a new model for easy data collection and entry has been developed by the project evaluation staff. This model is being refined on this contract and would be utilized to enhance the evaluation model being used in Cooperative Extension for family and youth programming.

--Youth gain skill and experience through participation in service experiences which meet community needs as indicated by 13,606 participants reporting that they worked collaboratively with interested adults to complete projects. Out of a total of 19,157 individuals participating in education to learn problem solving, 16,208 were observed to demonstrate problem solving and support for others in the community.

--In order to encourage teamwork, participants had to identify and agree upon common tasks, divide the task by identifying the contribution of each person. Out of a total of 14, 769 participants, 11,986 could identify and agree on the common tasks and the contributions of each participant. Out of a total of 4,125 participants, 3,550 voluntarily identified a mutual goal and shared responsibility for accomplishing that goal together. Out of a total of 4, 304 participants, 2,662 were able to take initiative, to begin, and to follow through on a task or plan together. Out of a total of 44,268 participants, 35,912 were able to carry out a plan of action in order to solve a problem. Out of a total of 44,242 participants, 36,325 were able to compare and choose between alternatives after receiving decision making skills education. Out of 7,222 individuals participating in extension education, 6,302 resisted alcohol, drugs, smoking, and other harmful activities.

--A new partnership developed between the Agricultural Experiment Station Research Center at San Juan, the Colorado Division of Wildlife, and Cooperative Extension in order to implement a

youth educational shooting sports program. In addition to the training that was provided to 17 youth, they were matched with a mentor who participated with them in the education workshop and in a hunting outing following the workshop.

Linkages: CSU College of Applied Human Sciences, College of Agriculture, College of Liberal Arts, Colorado Agricultural Experiment Station, county Extension faculty; Colorado Department of Education, Colorado State Department of Social Services, Colorado Governor's Office, Colorado County Commissioners, Colorado State Legislature, multiple agency and organizational leaders.

Source of Federal Funds: Smith-Lever

Scope of Impact: State Specific

Resources Allocated:

	1999-00	2000-01	2001-02	2002-03	2003-04	$ Equivalent
State FTE	1	2	3	3	5	1,351,714
County FTE	1	2	2	3	3	852,061
Total FTE	2	5	6	8	9	2,193,775
Budget	249,653	346,204	442,755	519,306	615,857	

Objective V.F: Increase rural economic diversification with special emphasis on existing business retention/expansion, small and home-based business emphasizing value-added agriculture, eco-tourism, forestry, and appropriate technologies and business/community mutual support.

The nature of many local challenges requires whole communities, regions, and the professionals who serve them, to engage in joint work. Some of these challenges are the interrelated topics of locally appropriate economic diversification, land-use decision-making and capacity building for teamwork, community spirit and cohesion--and small communities and non-metropolitan areas have special needs for support.

Coping with change and diversity is a continuing test of our collective energy. Colorado has experienced many population booms and busts, especially since the days of gold rushes, the advent of frontier railway service and statehood. Since then, as with Native Americans before them, waves of domestic and international migrants have been coming, with some staying and others leaving, according to their preferences for life-quality and lifestyle. With all these changes, the state's natural, agricultural, cultural and other resources have been capitalized upon according to fluctuations in local-to-global markets. The last ten years have been no exception.

Historically, the Colorado economy has relied on its vast forest and mining resources and its agriculture for raw products; its water to support life and development; its physical, cultural and social amenities to attract visitors and new residents; and the independent, entrepreneurial Western frontier spirit of its people. These combined legacies are helping to shape the future of Colorado, and they offer both challenges and opportunities for rural and urban development. The

challenges facing small communities and non-metropolitan regions of Colorado are of special concern because often they have relatively limited public revenues on which to rely, and few professional staff to assist them. The challenges facing small communities and non-metropolitan regions in Colorado differ between areas. A few areas continue to lose population due to a limited economic base, while others are gaining population more rapidly than they can integrate newcomers or supply infrastructure. Some communities continue to seek sustenance from family farms, production and value-added agriculture. A few depend on forestry or mining. Others rely on surrounding tourist attractions of mountains, forests, lakes, wildlife and historical sites. Some look to the payrolls of government installations; rely on incomes of resident-commuters who travel to metropolitan areas for work; look to prospects of commercial ventures like recreational facilities and casinos, private prisons, manufacturing plants, animal feeding operations, and other businesses. A growing number of communities are seeking new residents who bring retirement pensions or other sources of outside income (with some of the latter facilitated by telecommuting). Few can any longer rely on a single economic base.

Some small and rural communities struggle to survive as their traditional economic base changes. Native sons and daughters migrate to cities in search of higher-paying jobs and what they perceive are better lifestyles. In certain resort areas, families are forced to leave or commute due to high costs, lack of appropriate housing or career opportunity. The scale of agricultural enterprise now ranges from large commercial operations to small acreages with non-traditional operators. Changing land-use patterns, sharply escalating prices and accompanying management challenges abound. Interest in value-added enterprise is on the rise. Economic growth or decline is often accompanied by related challenges to an area's social well-being and stewardship of its natural, agricultural, cultural and open space resources.

Most Colorado communities in transition must be concerned with income-production for citizens and likewise public revenues, social well-being and natural resource integrity. To survive and prosper, they must attract young and old and nurture present residents and newcomers. They need vital services and physical infrastructure. They must anticipate and address changing circumstances so they are healthy well into the future. To do this they need widespread, informed citizen dialogue and action that acknowledges local-global and rural-urban interdependencies and that capitalizes on local resources, creativity, caring and the occasional support of concerned outsiders. They must foster caring and spirited social interaction and sound diverse economies while maintaining a quality life and environment. Achieving this balance is a challenge for communities. Many Colorado communities are in transition.

Projected Outputs:
1) Training for community teams in economic diversification models,
2) Electronic communication to share new opportunities for economic development and funding,
3) Workshops and web sites providing guidelines for eco-tourism and fisheries and wildlife economic opportunities.

Projected Outcomes*:*
1) Jobs created by enhanced business expansion or new businesses;
2) Improved business planning for realistic business success;
3) Improved business/community collaborative work for long-range economic development.

Year Three Results

Key Themes - Community Development, Impact of Change on Rural Communities, Jobs/Employment, Other: Business Retention/Expansion

New Action Committee:

The new Expanding Opportunities for Colorado's Employers and Workforce plan of work focuses on providing information, analysis and education to enhance effective labor management and personal professional development. The primary goals are to better inform and advise employers as to how to effectively manage their workforce in current regulatory and market conditions and to educate those preparing to enter or reposition themselves in the workforce. As a complement, the plan of work will include efforts to build connections with those agencies and institutions that support similar audiences. These goals are based on several assumptions:

- There is a mismatch between the training and abilities of workers and skills in demand among employers.
- There is a complex set of regulations and laws governing employer/employee interactions.
- There are unequal employment opportunities and labor force conditions across regions, with arguably greater challenges in rural areas.
- There are concerns about the affordability of living given prevailing wages in several areas of Colorado.
- The workforce is increasingly diverse in terms of gender, age, ethnicity, family situation and educational background.

Economic Diversification, Community/Business Support Outcomes:

1) With support of Cooperative Extension and other agency partners, interested communities and regions will identify and weigh collaborative, home-grown economic diversification options and strategies with potential to enhance private income production and local revenues while maintaining and strengthening natural resources and social well-being.

2) Community-regional groups will identify and weigh collaborative economic diversification options and/or strategies to enhance private income production and public revenues while maintaining or strengthening natural resources and social well-being.

Year Three Results

Key Themes – Economic Diversification

--Twenty-six of those participating considered complementing and building on local-regional strengths as they identified and weighed economic diversification options and/or strategies; 27 considered cultivating business-community mutual support (which benefited businesses and the community) as they identified and weighted economic diversification options and/or strategies; 27 considered encouraging existing business retention-expansion as they identified and weighed economic diversification options and/or strategies; and 34 considered fostering home-grown and home-based small business development (which capitalized on value-added agriculture or forestry and appropriate technology) as they identified and weighed economic diversification options and/or strategies.

--Cooperative Extension and other agency partners, supported interested communities and regions in their efforts to incorporate the most promising and feasible strategies into local-regional economic diversification partnership plans, and work to implement the plans over time. Community-regional groups translated economic diversification options and/or strategies (previously identified and weighed) into an action plan in 15 instances; of those action plans, seven encompassed a single town/city; 19 encompassed a single town/city & nearby farms/ranches/small acreages; and 14 encompassed a multi-county area.

--Twelve community-regional groups implemented part or all of their economic diversification action plan, including 9 single town/city groups; 9 groups that represented a single town/city and nearby farms/ranches/small acreages; 6 groups that represented several neighboring towns or a full county; and 4 multi-county area groups.

--With the support of Cooperative Extension and other agency partners, 82 community-regional groups identified and weighed economic diversification options. Twelve of these groups represented multi-county areas desiring to plan together. Thirty-one of these groups complemented and built on local and regional strengths in order to identify economic diversification options. Forty-one of the groups considered encouraging home-grown and home-based small business development as they identified and weighed economic diversification options. Fourteen of these groups translated their economic diversification options into an action plan.

Linkages: Center for Rural Assistance; Engaging Communities in Transition On-Going Program state team with its county/regional/campus-based membership; CSU-CE county staff--especially in Custer, Dolores, Logan, Morgan, Routt, Sedgwick, Summit, Weld counties and specialists in NW and NE regions; Sustaining Agriculture and Environment On-Going Program state team; CSU departments of Agricultural and Resource Economics, Design and Merchandising, Fishery and Wildlife Biology and Human Development and Family Studies; 4-H Citizen Washington Focus; Colorado Rural Development Council; USDA/CSREES/Land-Grant University Communities in Economic Transition Pilot Project; Colorado Department of Agriculture; Colorado State Forest Service; USDA-NRCS and RC&D's; USDA-FSA; US Forest Service; Colorado Small Business Development Centers; Colorado Rural Technology Academy; Colorado Department of Local Affairs; Colorado Open Space; Colorado's "Bean-Pole" Technology Grants Fund; Sedgwick County Technology Board; Montana State University Extension; University of Minnesota Extension; Western Rural Development Center; University of Wyoming Extension and WY Rural Development Council; local economic development organizations; Colorado's Region 9 Economic Development; Colorado Community College system; local public libraries; local Internet Service Providers; American Farmland Trust; Rocky Mountain Elk Foundation; Lucent Technology/EduQuest; the Rural Wide Web; local business leaders.

Source of Federal Funds: Smith-Lever

Scope of Impact: State Specific and Multi-State with Montana, Minnesota and Wyoming

Resources Allocated:

	19 99-00	200 0-01	200 1-02	200 2-03	2 003-04	$ Equivalent
State FTE	**1.5**	1.5	2	2.5	3	965,510
County FTE	**3**	2	3	4	5	1,224,912
Total FTE	**4.5**	3.5	5	6.5	8	2,190,422
Budget	249,653	167,325	422,755	547,582	672,408	

Stakeholder Input Process

Annual critiques and input on our Plans of Work are provided from our State Extension Advisory Committee and from County Advisory Committees. This is an ongoing process whereby critiques and requests are funneled through county faculty to regional directors and discussed at regional meetings on an annual basis.

In addition, we have instituted annual stakeholders' meetings in at least two separate regions of the state. In 2001, the campus-led development of a Strategic Plan for Agriculture provided approximately 200 community leaders to attend one of five regional meetings.

Out of the regional meetings, key issues for Colorado were organized into four Critical Issue Teams:

Addressing Growth Decisions
Empowering Family and Youth Voices
Understanding Biotechnology
Expanding Opportunities for Colorado's Workforce

Program Review

The program review process has not changed since the submission in 1999. We are currently talking with the Ag Experiment Station regarding some joint program review processes based on our joint development of a program accountability system.

Evaluation of the Success of Multi & Joint Activities

Multistate Projects - As shown in the attached table, Colorado State University Extension faculty are engaged in a great variety of multistate activities largely focused on the immediate high plains states or in the western region. The activities can be organized around our ongoing Program of Work Teams and provide additional resources and synergy in high quality programming and research.

Multistate Extension Activities

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

Institution___Colorado State University_____
State_____Colorado_____

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

Title of Planned Program/Activity	Actual Expenditures FY 2001
___See Attached Description and _____	_____$2,492,177_____
___ Table _____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Total _____

__Milan A. Rewerts_____ **_____April 3, 2003____**
Director **Date**

Form CSREES-REPT (2/00)

Multistate Extension Activities

Program	States	FTE	Funds
Colorado Center for Rural Assistance – Capacity Building	Arizona, New Mexico, Utah	.1	22,089
Colorado Engaging Communities in Transition	Arizona, New Mexico, Utah	.1	206,001
Certified Greenhouse Professional Program	Wyoming, Utah	.2	77,956
Colorado Water Outreach Program	Wyoming, Montana, North Dakota, South Dakota, Utah	.3	128,946
Veterinary Extension in the West	Nebraska, Wyoming, Utah	.3	256,641
Colorado Row and Vegetable Crop Foliar Disease Management	Nebraska, Wyoming	.2	112,352
Prairie Dog Conservation and Management	Arizona, Wyoming, New Mexico, Nebraska, Kansas, Montana, South Dakota, North Dakota, Oklahoma, Texas	.2	68,860
LandHelp	New Mexico, Arizona, Wyoming	.25	100,487
Turf Production and Management in Colorado	Wyoming	.2	35,096
Commercial Greenhouse Crops	Wyoming	.2	65,070
4-H Youth Life Skills Development in Archuleta County	New Mexico	.25	293,880
Sustainable Ag Using Alternative Methods in LaPlata and Archuleta Counties and San Juan County New Mexico	New Mexico	.2	127,904
4-H Youth Life Skills Development in La Plata County	New Mexico	.1	16,562
Living on the Land – Small Acreage Curriculum	Oregon, Nevada, Idaho, Washington, Utah, Montana, California	.3	272,934
Preserve Warhill Germplasm	Wyoming, Nebraska	.1	19,187
Southeast Colorado Dryland Cropping Systems	Kansas	.2	31,398
Northeast Colorado Dryland Cropping Systems	Kansas	.3	267,336
Food Safety	Wyoming, Minnesota	.2	136,512
Sunflowers	Nebraska, Kansas	.3	63,366
Coal Bed Methane	Wyoming	.2	144,096
Irrigation	Nebraska	.2	45,504
	Total		**$2,492,177**

Agriculture Experiment Station Integrated Activities

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

Institution___Colorado State University_____
State_____Colorado_____

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

Title of Planned Program/Activity	Actual Expenditures FY 2000
___See Attached Summary and the_____	_____$2,512,255_____
___Planned Programs Report_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Total _____

__Milan A. Rewerts_____ **April 3, 2003**
Director **Date**

Form CSREES-REPT (2/00)

Agriculture Experiment Station Integrated Activities

Program	Funds
Information Technology for Colorado Agriculture and Natural Resource Management	$ 31,762.50
Colorado Integrated Resource Management Western Center	26,850.00
Crops Testing and Alfalfa Variety Testing and Extension Education for Colorado	30,950.00
Colorado Environmental Pesticide Education Program	15,050.00
Sustainable / Organic Integrated Fruit Production for Colorado	15,525.00
Improving Certified Seed Potato Production and Management	43,500.00
Salinity Work in Colorado's Lower Arkansas River Basin	19,900.00
Turf Production and Management in Colorado	53,986.00
Colorado Drought Mitigation and Management Education	16,675.00
Colorado Row and Vegetable Crop Foliar Disease Management	48,140.00
Horticulture and the Green Industry	22,525.00
Precision Agriculture	15,833.00
Colorado Water Outreach Program	
Colorado Sheep and Wool	31,763.00
Colorado Field Crop Entomology	35,202.00
Southeast Colorado Dryland Cropping Systems	14,450.00
Eastern Regional Range-Livestock Drought	12,000.00
Northeast Colorado Dryland Cropping Systems	15,350.00
Southeast Colorado Water Management	17,175.00
Southeast Regional Range-Livestock	30,000.00
Commercial Vegetable Crop Production	15,075.00
Technology Assessment, Applied Research and Information Delivery for Potato Production in Colorado	68,940.00
Total	**$2,512,255**

Appendices