



Director's Message

2004 Annual Report Colorado State University Cooperative Extension

It is with pride and a deep sense of responsibility to Coloradans that we prepared this 2004 annual report. The past two years have been very difficult for the agencies of Colorado State University because of reduced state funding. Nonetheless we continue to focus on relevant issues to Coloradans, bringing the power of this land-grant university's research and education to the people of the state.

Cooperative Extension, along with the Agricultural Experiment Station, are defining units of this land-grant university. We are committed to conducting relevant research based on the issues of Colorado via the Agricultural Experiment Station system and providing information and education across the state through the Cooperative Extension network.

This annual report was developed partially in a joint effort with the Agricultural Experiment Station. Because of the research and education linkages fundamental to a land-grant university, we felt it important to highlight that connection and collaborative efforts. Lee Sommers, director of the Agricultural Experiment Station, and I encourage your review of the reports of joint efforts of Cooperative Extension and the Agricultural Experiment Station, as well as additional examples of Cooperative Extension educational work. We, as always, invite your feedback and comments.

As Cooperative Extension moves into the future, we want to be true to our mission of providing information and education and encouraging the application of research-based knowledge in response to issues affecting individuals, youth, families, agricultural

enterprises and communities of Colorado. To that end, we are actively participating with Colorado State University under the leadership of President Larry Penley in the development of a university-wide strategic plan. We have developed "Framework for the Future: A Strategic Plan for Cooperative Extension" which focuses on core competency areas where we have the capacity and expertise to address issues important to Colorado. We expect to serve as the "front door" to Colorado State University through our presence in 59 of the 64 counties. We also are working with the national Extension organization on e-Extension, a national web-based information and education network. This technology, along with our own online question and answer forum, AnswerLink, will complement our ongoing programs that we deliver through direct contact with Coloradans.

The programs highlighted in this report represent a small sample of the programs delivered every day by Cooperative Extension. As we deal with resource challenges in this time of uncertainty, we intend to continue with a strong local presence complemented by expertise on a more regional basis. Efforts are currently underway to increase revenue from contracts, grants and user fees in our educational programs. Said another way, Cooperative Extension is planning to grow into an uncertain future and be a strong, viable part of Colorado State University's future for Coloradans.

I hope you enjoy this report. I look forward to your feedback.

— Milan A. Rewerts
Director, Cooperative Extension
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Extension
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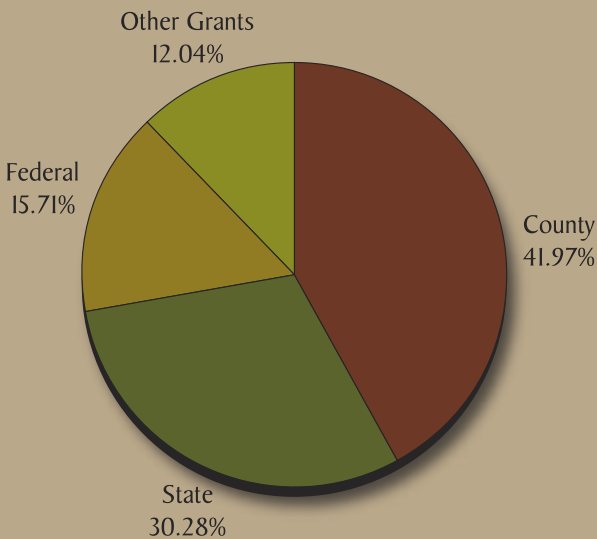
**Colorado
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Putting Knowledge to Work

Cooperative Extension Funding for Fiscal Year 2004-2005

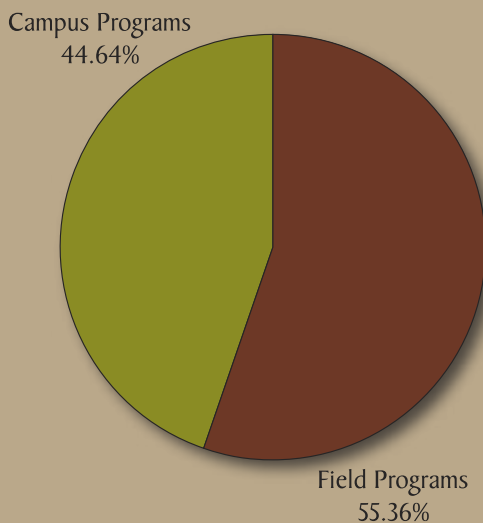
2004-2005

Cooperative Extension Funding



Total Funding = \$24,925,950

Appropriated Budget



Appropriated Budget = \$11,465,576

Cooperative Extension is the off-campus educational arm of Colorado State University. The Cooperative Extension system, a nationwide educational network, is a partnership of county, state and federal governments working cooperatively with the private sector. The Federal Smith-Lever Act established state Extension Services as a third program branch, along with resident instruction and research, of the land-grant universities in each state. Cooperative Extension agents and specialists are faculty of Colorado State University. They work with local constituents throughout Colorado in planning, developing and implementing the educational programs of Cooperative Extension. Volunteers also have an important role in the delivery of Extension programs. Cooperative Extension programs serve Coloradans wherever they live.

Funding for Cooperative Extension is provided from multiple sources: federal, state, county and non-tax monies. Federal funds are allocated to the states on the basis of law and formula. Additionally, some federal funds are earmarked to meet special national priority needs. Cooperative Extension receives state funds from Colorado State University's allocation through the Colorado Commission on Higher Education as part of the state's higher education budget. County commissioners appropriate annual budget funds to support the operation of the Cooperative Extension office in their county. Some funds are received from non-tax sources such as program grants and cost recovery fees.

Colorado State University Cooperative Extension Priority Programs

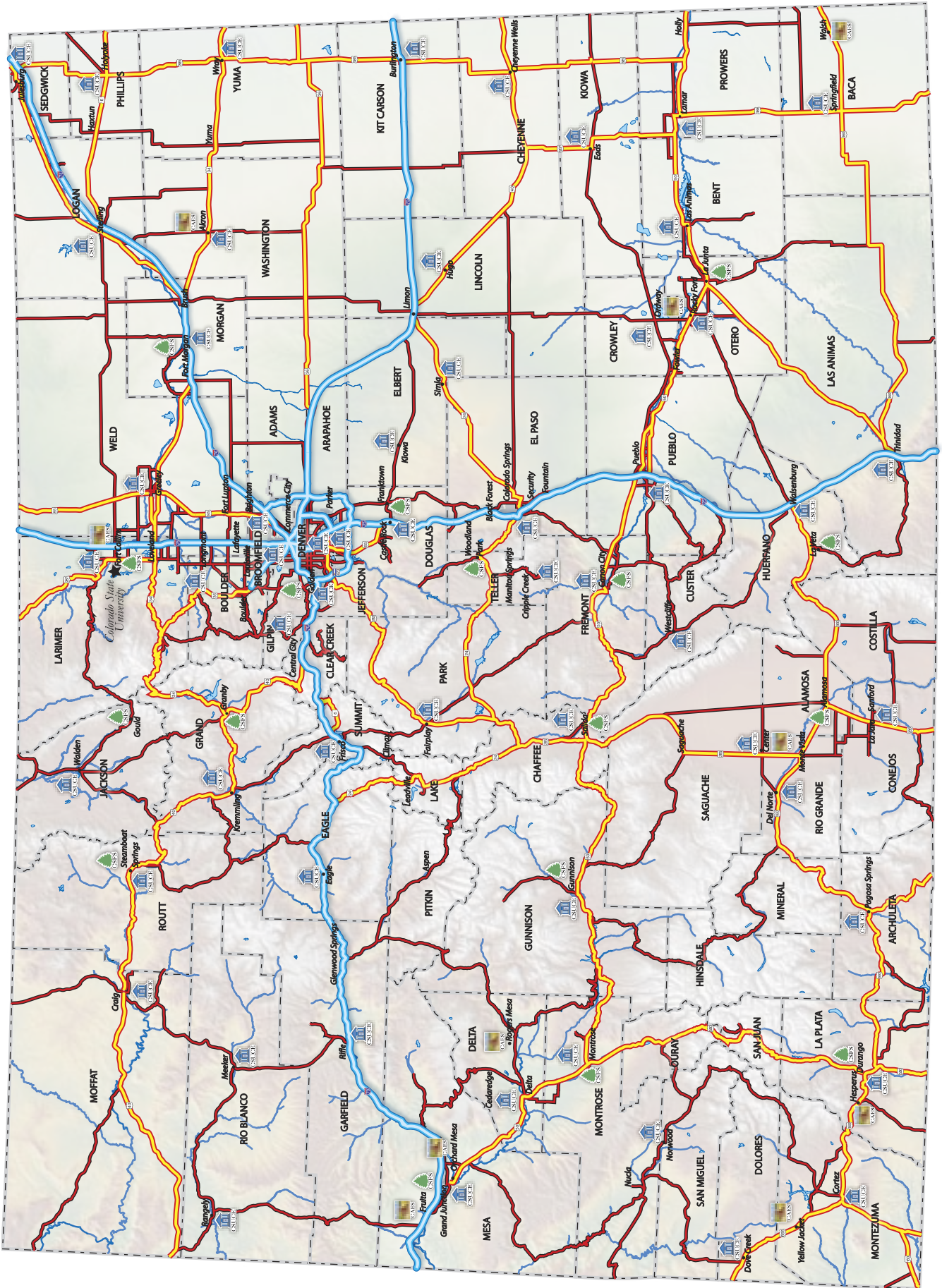
Cooperative Extension develops and implements educational programs in areas of high priority to Colorado citizens. For FY '04-'05, Cooperative Extension has focused its resources on thirteen statewide priority programs:

- Community Development
- Livestock Systems
- Family Resources Management
- Ag Business Management
- Horticulture
- Nutrition, Diet and Health
- 4-H/Youth Development
- Water Resource Management
- Small Acreage Management
- Crop Systems
- Human Development
- Pest Management
- Range and Natural Resources

Colorado State University Cooperative Extension County Offices

Adams County 9755 Henderson Rd., Brighton 80601-8114	(303) 637-8100	Kit Carson County 251 16th St., Suite 101, Burlington 80807-1674	(719) 346-5571
Alamosa County See San Luis Valley Area Office	(719) 657-0213	La Plata County 2500 Main Ave., Durango 81301	(970) 247-4355
Arapahoe County 5804 S. Datura St., Littleton 80120-2112	(303) 730-1920	Larimer County 1525 Blue Spruce Drive, Fort Collins 80524-2004	(970) 498-6000
Archuleta County 344 Highway 84, Pagosa Springs 81147-0370	(970) 264-5931	Las Animas County 200 E. 1st St., Room 101, Courthouse, Trinidad 81082-3000	(719) 846-6881
Baca County 772 Colorado St., Springfield 81073-1456	(719) 523-6971	Lincoln County 326 8th St., Hugo 80821-0068	(719) 743-2542
Bent County 1499 Ambassador Thompson Blvd., Las Animas 81054-1736	(719) 456-0764	Logan County 508 S. 10th Ave., Suite 1, Sterling 80751-3408	(970) 522-3200, ext. 0
Boulder County 9595 Nelson Rd. Box B, Longmont 80501-6359	(303) 678-6238	Mesa County 2775 Highway 50, Grand Junction 81502-5028	(970) 244-1834
Broomfield County 6 Garden Center, Broomfield 80020-2495	(720) 887-2269	Mineral County See San Luis Valley Area Office	(719) 657-0213
Chaffee County 10165 CR 120, Salida 81201-9404	(719) 539-6447	Moffat County 539 Barclay St., Craig 81625-2733	(970) 824-9180
Cheyenne County 425 South 7th W., Cheyenne Wells 80810-0395	(719) 767-5716	Montezuma County 109 W. Main St., Rm. 102, Cortez 81321-3155	(970) 565-3123
Conejos County 17705 Hwy. 285, La Jara 81140-9427	(719) 274-5200	Montrose and Ouray County 1001 N. 2nd St., Friendship Hall, Montrose 81401-3731	(970) 249-3935
Costilla County See San Luis Valley Area Office	(719) 657-0213	Morgan County 914 East Railroad Ave., Fort Morgan 80701-0517	(970) 542-3540
Crowley County 601 North Main St., Courthouse Annex, Ordway 81063	(719) 267-4741, ext. 7	Otero County 411 North 10th St., Rocky Ford 81067-0190	(719) 254-7608
Custer County 205 South 6th, Westcliffe 81252-0360	(719) 783-2514	Park County 880 Bogue St., Fairplay 80440-0603	(719) 836-4289
Delta County 525 Dodge St., Delta 81416-1719	(970) 874-2195	Phillips County 127 E. Denver, Holyoke 80734-0328	(970) 854-3616
Denver County 201 W. Colfax, Dept. 107, Denver 80202	(720) 913-5270	Prowers County 1001 S. Main St., Lamar 81052-3838	(719) 336-7734
Dolores County 409 North Main St., Dove Creek 81324-0529	(970) 677-2283	Pueblo County 212 W. 12th St., Suite 220, Pueblo 81003-2976	(719) 583-6566
Douglas County 410 Fairgrounds Rd., Castle Rock 80104-2699	(720) 733-6930	Rio Blanco County 779 Sulfer Creek Rd., Meeker 81641-0270	(970) 878-4093
Eagle County 551 Broadway, Eagle 81631-0239	(970) 328-8630	Western Annex 17497 Hwy 64, Rangely 81648	(970) 675-2417
Elbert County 325 Pueblo, Simla 80835-0128	(719) 541-2361	Rio Grande County See San Luis Valley Area Office	(970) 657-0213
El Paso County 305 S. Union Blvd., Colorado Springs 80910-3123	(719) 636-8920	Routt County 136 6th St., Courthouse Annex, Steamboat Springs 80477-2830	(970) 879-0825
Fremont County 615 Macon Ave., LL10, County Administration Building, Cañon City 81212-3390	(719) 276-7390	Saguache County See San Luis Valley Area Office San Luis Valley Research Center 0249 E. Road 9N, Center 81125-9643	(970) 657-0213 (719) 754-3494
Garfield County 902 Taughenbaugh, Suite 303, Rifle 81650-1112	(970) 625-3969	San Luis Valley Area Office 865 Oak, Del Norte 81132	(719) 657-0213
Gilpin County 230 Norton Dr., Golden 80403	(303) 582-9106	San Miguel-W. Montrose 1120 Summitt, Norwood 81423-0130	(970) 327-4393
Grand County 210 11th St., Extension Hall, Fairgrounds, Kremmling 80459-0475	(970) 724-3436	Sedgwick County 315 Cedar, County Courthouse, Julesburg 80737-1532	(970) 474-3479
Gunnison County 275 S. Spruce, Gunnison 81230-2719	(970) 641-1260	Summit County 37 Peak One Dr. CR 1005, Frisco 80443-1270	(970) 668-3595
Huerfano County 928 Russell Ave., Walsenburg 81089-2045	(719) 738-2170	Teller County 112 North A St., Cripple Creek 80813-0368	(719) 689-2552
Jackson County 312 5th St., Walden 80480-1077	(970) 723-4298	Washington County 181 Birch Ave., Courthouse Annex, Akron 80720-1513	(970) 345-2287
Jefferson County 15200 W. 6th Ave., Suite C, Golden 80401-5018	(303) 271-6620	Weld County 525 N. 15th Ave., Greeley 80631-2049	(970) 304-6535
Kiowa County County Courthouse, 1305 Goff, Eads 81036-0097	(719) 438-5321	Yuma County 310 Ash, Courthouse, Suite B, Wray 80758-1800	(970) 332-4151

Colorado State University – Agency Office Locations



Colorado Agricultural Experiment Station



Colorado State Forest Service



Colorado State University Cooperative Extension





Keeping Diabetes at Bay

Small Changes Do Make a Big Difference in Preventing or Delaying Diabetes

Jesse Ortega did just what the team who developed Small Changes Make a Big Difference hoped he would do. After attending the one-hour, lunchtime workshop on diabetes awareness in Arapahoe County he lost weight, started exercising and he's kept diabetes at bay.

Ortega, a workforce specialist with Arapahoe/Douglas Works, is happy he's been able to avoid taking medicine, even after his doctor diagnosed him as "on the edge of having diabetes."

Small Changes Make a Big Difference started in 2003 with Jane Frobose (pictured right in photo), Colorado State University Cooperative Extension family and consumer sciences agent in Denver, and Kay Zimka, then agent in Jefferson County. Each agent did needs assessments in their respective counties and decided to focus on diabetes for two reasons, said Frobose.

"First, type 2 diabetes is an epidemic in Colorado and across the country, and second, there was compelling research showing that for many people, this kind of diabetes can be controlled, or even prevented, by small lifestyle changes," Frobose said.

Frobose and Zimka were joined by Sheila Gains (pictured at left in photo) and Jennifer Eich, also Colorado State Cooperative Extension agents in Arapahoe and Adams counties, respectively, along with dietetic interns from Colorado State. Their goal was to create a self-contained program that could be easily offered throughout the state. The team, along with collaborators from the department of food science and human nutrition at Colorado State, Colorado Diabetes Prevention and Control Program at the Colorado

Department of Public Health and Environment and Salud Family Health Centers, put the Small Changes package on a compact disc and offered the CD (in both English and Spanish) to agents and others working in public health in Colorado and Wyoming.

The CD includes a PowerPoint presentation, activities and handouts for participants, pre-, post and follow up surveys and evaluations, risk statistics for diabetes for Colorado and the nation, print-ready posters to promote the workshops and information on additional community resources.

Gains reported that during the first year, the program was delivered to more than 350 people in Colorado and the CD distributed to some 100 Extension agents and health educators in Colorado and Wyoming. Those participating have shown a 20 percent average increase in knowledge of type 2 diabetes, including risk factors, signs and symptoms, and disease complications. Most important, participants have learned actions they can take to reduce their risk or delay the onset of type 2 diabetes. Post surveys of participants showed that after taking the workshop, 89 percent developed a personal plan of action to change their behavior in at least one way to reduce their risk.

Gains said the one-hour session is appealing for several reasons. "We often present during a lunch hour, so it's easier to make time. Also, this information is broadly aimed at those who think they may be in a high risk group or those who are interested in gaining information for a family member who may be at risk, so there's no need for participants to identify themselves as diabetic," Gains said. And probably most important for those attending, there's good

The Small Changes program encourages people to take action to control their own health.



Putting Knowledge to Work

news about the steps people can take to fight this disease.

A 2002 research report from the national Diabetes Prevention Program at George Washington University showed that while lifestyle changes and treatment with medicine both reduced the incidence of diabetes in people at high risk, the lifestyle intervention was more effective than the drugs. Frobose adds, "Just a 5 to 7 percent weight loss and the addition of walking 30 minutes a day, five times a week, was shown to be effective in preventing diabetes in a high risk person. This is good news for a lot of people."

Approximately 17 million people in the United States, or 6.2 percent of the population, have diabetes, a 50 percent jump from 1990 to 2000. About one-third of those with type 2 diabetes don't know it, because the disease often shows no symptoms for seven to 10 years, Gains said. Early detection is important because over the years high blood glucose damages nerves and blood vessels, leading to complications including heart disease, stroke, blindness, nerve problems, kidney disease, gum infection and amputation.

For Jesse Ortega the program was just what he needed. "This class enlightened me. I was already doing about 75 percent of the things they recommend, but adding the other



25 percent really made a difference. My blood pressure and cholesterol are down and I'm doing more exercise. I'm even hoping I can get off my blood pressure medicine eventually."

Jhanadu Garza, who works in risk management for Arapahoe County, said Small Changes Make a Big Difference helped her understand more about the diabetes that runs in her family and gave her the insight to make some changes, including losing weight. "I was really encouraged to learn that even a 10 percent weight loss could make a big difference for me," Garza said.

– Mary Pat Adams

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More Strides to Prevention

The Small Changes team has now revised the original program into a 2004 version with improvements based on test results, said Gloria Vellinga, community health coordinator with the Colorado Diabetes Prevention and Control Program and team member.

"This is just a great prevention message, and with all the bad news about the increasing numbers of people with type 2 diabetes, it's important for us to talk about a program that really makes a difference in people's lives," Vellinga said.



Planning for a Future

Financial Security in Later Life Helping People Prepare for the Future

Dub Couch (pictured at left) was looking for ways to make his money work harder when he attended a series of seminars offered by Colorado State University Cooperative Extension called Financial Security in Later Life.

The 75-year-old Rocky Ford resident proudly proclaims he found what he was looking for. "In 10 months, I've gotten a 7.94 percent return that beats the heck out of 3.25 percent."

Semi-retired, Couch buys and sells golf carts and he's looking ahead to full retirement. "I feel that I want my money to make all the money it can for 10 more years. At that time I want to run and play."

Couch learned about retirement planning, types of investment products, legal issues and long-term care insurance in the five-session program held the spring of 2004 at the Otero County Cooperative Extension office in Rocky Ford.

The sessions represent a national initiative of the Cooperative State Research, Education and Extension Service (CSREES) aimed at meeting the retirement planning needs of folks like Dub Couch. Strengthening the capacity of families and individuals to establish and maintain economic security is at the heart of the initiative.

"At a national level, resources were assembled to support each of the states in carrying out this initiative," said Jacquie Miller, Cooperative Extension family economic specialist.

Research from CSREES in 2001 showed that retirement confidence had declined and fewer people were planning for retirement. A survey found that only 46 percent of the baby boom generation was saving for retirement.

"We're not good savers in this country," Miller said, "but after this seminar, 98 percent of the participants that responded said they felt prepared to make decisions about investments and would add at least two additional tasks to their financial planning such as reducing expenses to reach investment goals and consulting with a financial planner."

Brenda and Dave Daniher drove 45 minutes each way to attend the Financial Security in Later Life seminars in Rocky Ford. The Danihers live on a ranch 20 miles south of La Junta where they raise Shire draft horses and cattle.

"The seminar from Cooperative Extension that caught my eye was the one on how to make a will," Brenda Daniher said. Today she is the process of creating this important legal document.

The seminars helped the Danihers better understand what their retirement future looks like. It confirmed that they are on track in their planning, Brenda Daniher said.

"We do have some small investments in retirement programs and we realized that if we live frugally now and continue to live frugally, our golden years will be modest ones. But we are modest people anyway. It was nice to find out that we're doing all right," she said.

The Danihers and Dub Couch were among 200 people around Colorado to participate in Financial Security in Later Life sessions held around the state last year.

Statewide, the program is targeted at baby boomers and older individuals, even people who are already retired, Miller said. "At the community level, agents recruited audiences from either the general public or workplaces."

In Otero, Bent and Crowley counties, Jean Justice, area Extension agent, family and

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consumer sciences, wanted to follow up on a series of women's financial education classes offered in the early 1990s.

"I thought this was a natural continuation of that, the next step. With everything going on in the economy today and the number of baby boomers we have out there, this was a natural time to do it. To make sure that particularly the baby boom generation would be ready for retirement."

Justice delivered the sessions on planning for retirement and making long-term care insurance decisions. She recruited a local financial planner and a lawyer to lead the other sessions. Justice had additional community support for the program.

"All of our local banks donated money to help support it and pay for advertising. One bank gave scholarships."

A team of Colorado agents tailor materials created at the national level for their local programs, Miller explained. "Our Colorado Web site was set up for our educators. Agents can click and download and copy handouts or outlines or get PowerPoint presentations."

Each of the seminars in the program is designed to spark action by the participants. In Colorado, these activities included estimating income sources and monthly financial needs in retirement, using a template

created by Colorado Cooperative Extension to estimate retirement savings needs.

The work doesn't stop after the seminar sessions end. Attendees go away with "to-do" lists that might include crafting goal-oriented investment plans, calculating the amount of money needed to achieve their retirement goals and researching specific investments.

Agents gathered evaluation summaries after each session to help gauge the benefits of offering the seminars. "We asked them questions about what they had already done

to prepare for retirement and what they were planning to do," Justice said. "We also asked them to



rate the financial value of the workshop."

In general, participants found it valuable, she said. The majority of Otero County participants placed the financial value of the seminar series to themselves as between \$100,000 and \$500,000.

Miller said CSU Cooperative Extension plans to continue the Financial Security in Later Life seminars.

"The national figures on financial planning are just too daunting for us to ignore," Miller said. "With approximately 60 percent of Americans who die without a will, trust or advanced health directive, we already have plans in place for an updated legal education program, called, Legally Secure Your Financial Future."

— Sue Lenthe

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Coloradans Get Prepared

According to an impact statement created by Cooperative Extension from data provided by participants in the 2003-2004 Financial Security in Later Life seminars, more than half of Coloradans who attended said they were well prepared to make decisions about their retirement concerns following the seminars. Most of the remaining participants – 46 percent – felt they were somewhat prepared.



Growing People

Volunteer Support Extends Reach of Cooperative Extension Programs

Millions.

That's the dollar value of volunteer hours donated to Cooperative Extension programs.

Across the state, whether it's native plant masters, Colorado master gardeners, 4-H leaders, food safety advisers or others, thousands of Coloradans are putting in thousands of hours annually.

Their efforts multiply Cooperative Extension knowledge, research and resources exponentially.

Take 4-H, for example. Dale Leidheiser, Extension 4-H youth development specialist, said that in 2003 a volunteer group 12,659-strong put in an average of 128 hours per person per year.

The statewide professional staff of 60 full-time workers couldn't begin to make a dent in the program delivery 4-H volunteers provide.

The U.S. Department of Labor values volunteer time at \$17.19 per hour. That's a dollar value of more than \$25 million in 2003 for 4-H volunteer hours alone.

Cooperative Extension's Colorado Master Gardener program offers similar benefits. David Whiting, Extension consumer horticulture specialist and Colorado master gardener coordinator, said there are about 1,700 volunteer gardeners statewide. In Boulder County, for instance, there are two Extension agents working in horticulture and 300 Colorado master gardeners.

"The Colorado master gardeners multiply the staff potential by hundreds," Whiting said. "If we did not have our volunteer gardeners, we would not be serving home horticulture. The Extension agents' time is spent working

with the volunteers and the volunteers' time is spent serving the community."

Whiting said the value of Colorado master gardeners' time is about \$1 million a year. "I'm excited about that. That's quite a contribution back to our community," he said.

Around the state, volunteer gardeners like Steve Kanewske (pictured at left) of Denver answer phone calls in county offices, help with school and community projects, at farmers' markets and plant diagnostic clinics.

Kanewske has been serving as a Colorado master gardener since 1996. Retired from a position at US West as director of corporate advertising and brand management, Kanewske said he wanted to learn more about gardening.

"I've always had an interest in horticulture and did it as a hobby. When I retired, I had a desire to get a little more solid foundation in some of the dos and don'ts and the proper way to do things. This was an excellent way to do that."

Master gardeners receive 60 hours of training taught by Colorado State University horticulture specialists and Extension agents. Once trained, the volunteers are required to contribute 50 hours the first year and 24 hours each year after that.

Kanewske has found a variety of ways to donate his time as a Colorado master gardener. He works with Habitat for Humanity homeowners on the design, installation and maintenance of their landscapes. He volunteers at the ProGreen Expo held each year in Denver, serves on a speakers bureau and helps review applicants for new volunteer gardener positions.

The Native Plant Master program, offered jointly by Gilpin and Jefferson counties Cooperative Extensions, is a volunteer-

Cooperative
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volunteers
multiply staff
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hundreds ... and
they just keep
putting in hours.

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training program twice removed. The program trains a handful of trainers who then train larger groups of trainers.

"We're training the staffs and volunteers of other agencies. We do not have to manage those volunteers but they use the information," explained Barbara Fahey, director of Jefferson County Cooperative Extension.

Fahey launched the program in 1997, which asks each native plant master to commit to teaching 30 people about Colorado plants every year.

From there the benefits begin to multiply like ripples on a pond.

"We're in the thousands of public contacts every year. Through the end of 2003 we had 51,399 direct educational contacts as a result of this program," Fahey said.

"In 2003, more than 14,000 public acres have had noxious weeds controlled on them. More than 16,000 acres had native plants used in landscapes. That's more than 30,000 acres impacted by the program." Fahey said.

In 2004 alone, by the end of the third quarter the program had 3,755 direct educational contacts.

Volunteer trainer Christine Leahy said that participating in the Native Plant Master program allows her to explore a personal passion for native plants. She was already at work in the environmental education field when she helped Barbara Fahey develop the program. Leahy was director of Jefferson County's Lookout Mountain Nature Center at the time.

"Barbara and I worked together to conceptualize this idea of having an educational program that empowered homeowners and resource staff to teach the public about native plants," Leahy said. "There wasn't time for me to do that while on the job, even though the position I had was in environmental education. So I was committed to doing that with Barbara on a volunteer basis."

The Native Plant Master program focuses on teaching people about native plants as well as the nonnative plants and weeds that can threaten them. As they learn to identify various plants and their places in the local ecosystem, they become increasingly excited, Leahy said. "It helps them value these plants in a way they have not, perhaps, thought of before."

The efforts of volunteers like Leahy and Kanewske extend beyond the obvious roles of teaching people about plants or gardening, cooking or sewing, or raising cattle. Extension volunteers are engaged in community building.

Helping people with home gardens, for instance, isn't just about growing better backyard tomatoes. "Gardening is how people teach children job skills. It's a creative outlet, it's a stress reducer," Whiting pointed out. "We're not in it because we want to garden. We're in it because we're growing people."

– Sue Lenthe



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More than a Monetary Return

Colorado State University Cooperative Extension statewide 4-H staff of 60 full-time workers can't begin to make a dent in the program delivery 4-H volunteers provide. In 2003, a volunteer group of 12,659 4-H leaders put in an average of 128 hours per person. According to the U.S. Department of Labor, who values volunteer time at \$17.19 per hour, this translates into more than \$25 million of service to their communities.

In exchange for 60 hours of training from Colorado State, over 1,700 Colorado master gardener volunteers give their communities 50 hours of service their first year and 24 hours of service the following years. This contribution is estimated at \$1 million a year in service to Colorado communities.



High-Tech Weed Pulling

4-H Youth Help Routt County Manage Noxious Weeds and Learn High-Tech Skills

Mapping
the location
of weeds
helps resource
managers
understand the
extent of the
problem.

The Routt County 4-H community mapping project is a parent's dream come true.

The project represents a happy confluence of kids, high-tech computer applications, the outdoors and community service. The outcome: relevant experience in real-world endeavors.

Thanks to a partnership with the Orton Family Foundation, and knowledge gained about Global Positioning System and Global Information System technology, six youth from Routt County took on the task to help local resource managers by mapping noxious weeds at Elkhead Reservoir in Elkhead State Park.

Jay Whaley (pictured in photo), Routt County 4-H youth coordinator, organized the project after being contacted by Connie Knapp, community mapping program manager for the Orton Family Foundation in Steamboat.

"Community mapping is a tool used by all kinds of decision makers," Knapp said. "In the case of the Routt County project, mapping the location of weeds around the reservoir helped resource managers understand the extent of the problem and make decisions about how to deal with it."

"Our community mapping program puts youth working alongside community members on real issues so that they learn new skills, like GIS technology, and how to apply it to decision making," said Knapp. The program also teaches youth that math, science and technology skills have applications in the real world beyond school.

"I think the real carrot in this whole community mapping process is that kids learn in a real-world context that it's not that they have to learn math or how to measure pH just

because they should," she said. "They see it being done for authentic reasons, are brought into the whole process of looking at the problem, monitoring it, assessing trends and hopefully working with the state parks folks to find out how to minimize those weeds."

The Routt County project also helped resource managers comply with a 2003 government directive requiring all state agencies to map tamarisk, a new invasive weed found growing along waterways, Whaley said.

Whaley launched the project in February 2003 by rounding up kids he thought would be interested, based on past 4-H projects. Ultimately, a group of six, ranging in age from 12 to 15, came together to form the 4-H community mapping team.

"It's a pretty unique group. We have three from Hayden, on the western side of the county, one from Steamboat and two home-schooled kids," Whaley said.

Emily Hallenbeck, a 15-year-old native of Hayden, said at first she wasn't very interested in the project. But the technology element and a friend's participation hooked her.

"I got interested because it had to do with computers," she said. Like many kids her age, Hallenbeck enjoys "messing around" with computers and discovering the different things that she can do with them.

After selecting the team, the next step was a class in GPS technology, which consists of 27 satellites orbiting the earth and a series of ground stations around the world that monitor these satellites.

Both civilians and members of the military use handheld GPS receivers to communicate with the satellites using radio waves. Combining information from four satellites, the receivers are able to pinpoint

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and save a location on earth, called a "way point." This data then can be loaded into a computer with Geographic Information System software and used to create maps.



usable map keys for their maps.

Whaley plans to continue the 4-H community mapping team again in the spring of 2005. He also hopes to help educate

Once the group was familiar with the hardware and software, members spent a full day surveying Elkhead reservoir. Happily, Whaley said, they found no tamarisk there. By boat and on foot the young mapping team members marked all of the Russian Olive plants they found using their handheld GPS units.

With their data in hand, team members paired up, with each pair creating a map. "So they not only learned how to load the way points on to the computer, we taught them all the things that need to be on a map and what they were trying to relay," Whaley said.

"It was easy to make the points," Hallenbeck said, referring to the way points created with the handheld GPS units. "But it was hard to put them into a map and design the map so it was attractive for people to read."

Hallenbeck said it took time for team members to figure out all the things the computer systems could do along with choosing appropriate colors and creating

others in 4-H about the power and potential of GPS and GIS technologies. He has developed a seven-step process for implementing projects.

Meanwhile, the GPS units haven't been gathering dust. "The kids come back in and check out the units."

One team member gathered a group who went out and mapped noxious weeds on his father's ranch. Hallenbeck and her friend, Jennifer Epp, mapped hounds tongue, a cockle-burr-producing weed, in the Hayden Town Park. They devised a control plan – chopping down the plants and bagging seed heads – and plan to go back in the spring to monitor the problem.

Whaley said the technology involved in community mapping offers opportunities for 4-H to expand its relevance to youth. "A lot of times the public sees 4-H as cooking and cow projects. They don't realize all the citizenship and leadership and now even technology we're providing to youth."

– Leigh Fortson

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4-H Agent Tackles Community Mapping

Routt County 4-H youth coordinator, Jay Whaley, launched the 4-H community mapping program in February of 2003, to help the county meet a government directive to map tamarisk, an invasive plant growing along waterways. Whaley chose six 4-H youth who had worked on past 4-H projects, three from the west side of Routt County, one from Steamboat, and two home-schooled youth. All youth on the team shared a common interest...computers.



Pickle Co-op Pays Off

Northern Colorado Farmers Pool Resources, Find Profit in Cucumbers

Larimer County farmer Mario Herrera (pictured at left) probably didn't know he was about to take on a challenge that had frustrated many before him. Herrera, the founder and force behind the Northern Colorado Pickle Cooperative, believed the idea of growing cucumbers for food processor Dean Foods was a good one and

thought a co-op with local farmers just might work. And so far, with a successful 2004 harvest and a three-year contract, it has.

Herrera first met Bob Hamblen, Colorado State University Cooperative Extension director for Boulder County, and Roberta Tolan, Extension horticulture agent in Larimer County, at a Mile High Growers Group meeting in 1999. Hamblen, Tolan and others were working with local farmers to find crops that could be grown profitably in the Front Range counties. Herrera, who began farming at his current location just east of I-25 near the Weld/Larimer County line in 1990, had previously grown cucumbers for Dean Foods, but gave it up when the food processor closed its facility north of Greeley. Herrera still had the name of a contact at the Dean plant in La Junta in southern Colorado, and suggested the growers group consider trying to grow cucumbers for pickle processing.

While Herrera knew growing cucumbers for a pickle processor could provide a farmer an excellent profit, he also knew the many challenges, including the debate over mechanical vs. hand harvesting, the problem of picking the cucumbers quickly once they reach the preferred size, and the race to get the cucumbers to the processor within hours of being picked.

Herrera credits Ernie Marx, Extension agriculture agent in Larimer County, and others within the Extension system for guiding him through the process of determining that cucumbers would be the best bet for a crop that could produce a good return per acre, and staying with him during all the steps of developing the co-op.

"We considered string beans, carrots, onions and peas, but cucumbers fit our growing season for this area so well," Herrera said. A cucumber crop harvested for pickle production can provide a return of up to \$1,000 an acre, compared to the \$50 an acre return on other crops traditionally grown in the area, such as barley, sugar beets and pinto beans.

Dean Foods welcomed the idea of cucumbers grown in Colorado for the La Junta facility, rather than the Texas cucumbers they were buying, because fresher cucumbers generally mean better pickles. But even with a crop known to be successfully grown and harvested in the area, one of the biggest hurdles would be forming a co-op that worked. The advantages to a co-op, such as a shared contract with a food processor, sharing the purchase of expensive equipment and a pooling of experience and knowledge, are often not enough to overcome the obstacles, said Doyle Smith, Director of the Colorado Cooperative Council. Smith said many new co-ops fail each year in Colorado, mainly due to lack of proper planning and a shortage of capital.

Smith met with Herrera, Marx and others from Colorado State Cooperative Extension and encouraged them to try for greater up-front capital for the pickle co-op. Herrera and the other 15 grower members paid a per acre

Farmers worked
with Extension
agents to find
information and
talk through the
issues.

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fee to join the co-op and pay an additional fee per acre to self-insure the co-op against problems with the harvest. The co-op of farmers in the Johnstown, Berthoud and Milliken areas had 320 acres in cucumbers in 2004 and may increase that number for 2005, Herrera said, but added that this is a closed co-op because Dean Foods contracts for only a certain number of bushels of cucumbers.

During the process of finding farmers willing to join the co-op, determining the production cost per acre, negotiating with Dean Foods on a contract price for the cucumbers and learning the intricacies of mechanical harvesting, Herrera worked with Marx and other agents to find information and talk through the issues. "Their knowledge of resources and ability to run the numbers and find the answers was really invaluable, and they didn't try to encourage or discourage us on a certain path, they asked lots of tough questions and then helped us find the answers," Herrera said.

"The Cooperative Extension agents and specialists are a tremendous asset to have, they have absolutely nothing to gain – they just wanted to see us succeed," Herrera said.

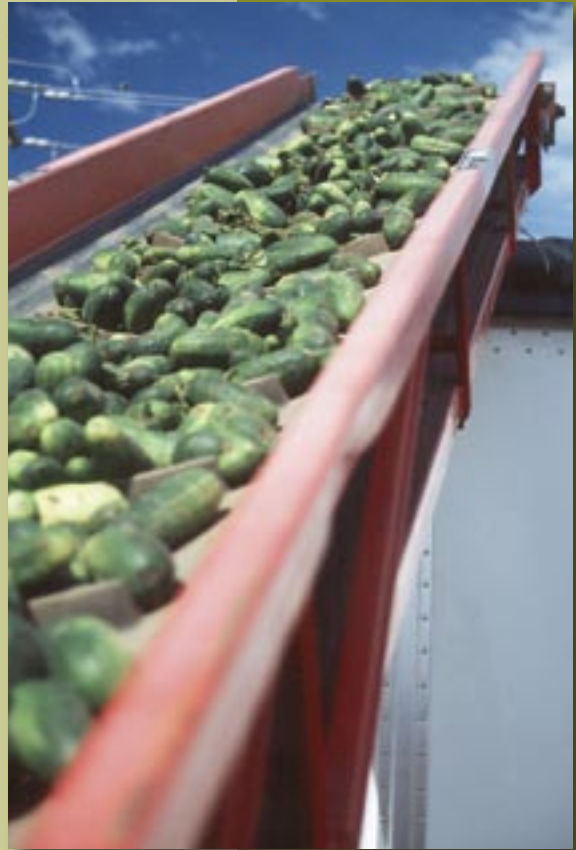
Herrera's original invitation to farmers in the area to learn about the co-op resulted in only a 10 percent response, so he had to try again to come up with enough farmers who were close enough together to make the sequenced harvesting work. When cucumbers reach peak pickle size they must be quickly harvested or they're of no use to the processor. For the Northern Colorado Pickle Co-op, members agree to a planting schedule that allows for a staggered harvest so the three

mechanical harvesters the co-op purchased can move from field to field in an orderly process.

Only three of the 16 co-op members had commercially grown cucumbers for pickles, so they had many questions. "Mechanical harvesters have been around since the 1960s and now about 60 percent of the cucumber crop is picked that way, but there are some adjustments and things we had to learn to be able to make it work for us," Herrera said. They enlisted the help of Ed Kee, a professor and Cooperative Extension specialist with the University of Delaware and expert in cucumber harvesting, who has visited Herrera's and other farms in the area several times to give advice. Marx and Herrera returned the favor with a trip to Delaware in January 2005, to talk with Kee and his colleagues about the pickle project in Colorado.

Marx said the credit for the pickle co-op success goes to Herrera for "the incredibly good job he did in researching and writing the business plan," as well as Herrera's credibility among area farmers. Herrera said he "can't give enough praise and thanks to Cooperative Extension" for the part they played in the creation of the pickle co-op.

– Mary Pat Adams



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Sequenced Harvesting Seals the Deal

With a food processor on board that preferred Colorado grown cucumbers, Cooperative Extension helped Herrera identify issues, run numbers and find answers that eventually convinced other growers to join the co-op. Since cucumbers have to be processed within hours after they're picked, members of the co-op agreed to a planting schedule that would allow for staggered harvests and mechanical harvesting.



Restoring an Ecosystem

Extension Agents Contribute to Award-Winning Partnership Among Agencies

In 1999, The Colorado Division of Wildlife (CDOW) recognized that mule deer and elk on the Uncompahgre Plateau were competing for winter food sources, and that the mule deer were losing. In an effort to boost their survival, \$500,000 of CDOW capital construction funds were necessary to complete the mission of improving their habitat. This infusion of funds launched an unprecedented collaboration between the CDOW, Bureau of Land Management, US Forest Service, and the Public Lands Partnership (PLP) that ultimately created the Uncompahgre Plateau Project (UP).

These days, UP reaches beyond concerns posed by the mule deer and is responding to wildlife and ecological degradation resulting from decades of grazing, logging, the introduction of roads, and juniper colonies created from fire management efforts. Overall, the project embraces the region's economic, social, cultural and ecological issues and is impacting 1.5 million acres of private, state and federal lands – 75 percent of which are public.

Successfully fulfilling their mission “to develop a collaborative approach to restore and maintain the ecosystem health of the Uncompahgre Plateau, using best science and public input,” UP now boasts collaboration between approximately 50 governmental agencies and more than 600 private citizens. The project has received national press coverage and the attention of Lynn Scarlett, the assistant secretary of policy, management and budget at the Department of Interior (DOI) who visited the plateau last April. More recently, Kathleen Clark, director of the DOI, awarded UP with the nationally recognized 4 C's award (Conservation

through Communication, Consultation and Cooperation).

Colorado State University Cooperative Extension livestock and range agent, Robbie Baird LeValley, joined the collaboration soon after it was established. Participating under the umbrella of the PLP, Baird LeValley brings to the table 16 years of expertise in range and livestock science. Since her involvement in the project, LeValley has served as liaison between public land permittees, private landowners and the various government agencies. She's kept each entity aware of what the others were doing and what kind of science was necessary to move her part of the project forward. Her ability to communicate to these diverse groups has contributed to the ongoing success of the project.

“Collaboration of this magnitude, on 1.5 million acres and with the level of detail the agencies have given to it, is rare,” said Baird LeValley who is one of eight members of UP's technical committee. “One of the most promising components of the project is that it's portable to other people working on other landscapes. What we're doing will be a good, practical working model for projects occurring elsewhere in the future.”

The overarching goal of UP is to improve the quality of the ecosystem's health and restore the natural functions to the Uncompahgre Plateau. Specific goals include:

- increase the species, age diversity, and productivity of native plant and animal communities,
- change the distribution of plant age classes to match a more natural distribution,
- improve watershed health, water quality and yield,

The goal of this partnership was to restore natural functions to the Uncompahgre Plateau.

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- improve habitat quality for most wildlife species,
- increase the recruitment and natural survival of mule deer,
- improve the distribution and quality of the mule deer winter range,
- develop community partnerships to promote the health of the Plateau while sustaining social and cultural values,



- provide new stewardship opportunities for sustaining community-based natural resource businesses, and
- demonstrate a collaborative partnership between communities and agencies working together in an adaptive approach to ecosystem management tailored to restoration efforts across jurisdictional boundaries.

Baird LeValley currently teams with CSU Agricultural Experiment Station Research Scientist Ron Godin, and representatives from Utah State University and the Utah Department of Natural Resources, to develop a program to produce seeds native to the plants on the Plateau. Seeds from vegetation on the Plateau will be collected and taken to producers who will plant and grow them at their farms or ranches. The plants will then generate their own seeds, which will be taken to one of the test sites on the Plateau where they will be planted again.

From the get-go, Baird LeValley urged that local growers be selected to participate in the seed development project, identifying nine producers with appropriate growing sites. LeValley and Godin's expertise and

active participation will greatly contribute to restoring the plant balance on the Plateau, but it will also provide additional income to enterprising producers.

"This has been a great learning experience for me," said Godin who is located at the Rogers Mesa Research Station in Hotchkiss. "Even though we're just beginning with this project, I love trying new technologies that we can hopefully pass on to growers. It will take about five years to get there, but in the end, it will help growers diversify and increase their profit margins." The long-range goal, he said, is to revegetate 6,000 or so acres per year over the next ten years. To do that, growers will provide about 500 acres for cultivated native seed production and grow up to 60 plant varieties.

The plant seed program will go on indefinitely, and LeValley hopes that it will become business-as-usual for the participating producers and future growers. Between the efforts to restore the natural conditions on the Plateau and boost the economic viability of area producers, UP qualifies as one of the most successful partnerships on record.

– Leigh Fortson

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More Heads are Better Than One

This project brought together approximately 50 governmental agencies and more than 600 private citizens. The restoration of the Uncompahgre Plateau impacted 1.5 million acres of private, state and federal lands, of which 75 percent are public.



Teamwork Pays Off

Extension, Experiment Stations Merge Strengths to Meet Market Demands

When consumers in western Colorado shuck an ear of sweet corn and delight in the clean, bright kernels, they're witnessing the benefits of partnerships between Cooperative Extension and Agricultural Experiment Station (AES) at Colorado State University. That's because corn that's picture-perfect, disease- and insect-free, sweet, and delicious doesn't happen by accident. Rather, it's because of a long-standing and deliberate effort to prevent the corn from environmental hazards and to create optimum conditions for the highest-quality product possible.

While both Extension and AES may have similar expertise and knowledge, they fulfill different roles. Extension agents work in the field, side-by-side with farmers and ranchers to help identify any problems they may be having or to determine what problems might be developing that haven't yet materialized. Likewise, AES provides the scientists, equipment, and facilities necessary to conduct long-term controlled studies in response to data collected by the field agent. As they study pests, diseases, moisture, temperature, and soils under controlled conditions, they are able to discern the best herbicides, spraying practices, harvest times, packing methods, and more.

An example of the positive impact of these partnerships was recently played out in Mesa County. In 2001, a corn-loving pest called a sap beetle infested about 400 acres of sweet corn, wreaking havoc on the crops and adding up to a harvest loss of about \$500,000. Extension entomologist Bob Hammon, along with AES research scientist, Rick Zimmerman (Rogers Mesa), Fred Judson

(Fruita), and John Wilhelm (Orchard Mesa) began studying the beetle in controlled plots to learn how it caused the damage and how it could be controlled.

Within one year, they discovered that a change in the timing of chemical spraying could greatly reduce the impact of the beetle, and subsequently, thousands of acres of sweet corn were saved in future harvests.

Studies on how best to combat the sap beetle are ongoing, but even what the agents have gleaned so far has helped and given growers encouragement.

Olathe resident John Harold grows 1,400 acres of sweet corn, onions, and feed. "The folks at CSU have put a tremendous amount of research into insects and managing water and soil pH levels. They've also helped with EPA training and labor. What they do for us is so beneficial that if they weren't around, we wouldn't have half the success that we do."

Extension agronomist Wayne Cooley, with John Murray of the Natural Resource Conservation Service, recently put together growers, Extension agents, and scientists to help treat the pH levels in the soils and irrigation water around the Uncompahgre Valley where Harold farms. According to Rogers Mesa Experiment Station research scientist Ron Godin, high soil pH levels prevent plants from taking up adequate nutrition, so he is conducting the first year of a three-year study to remedy the problem by adding sulfur and compost to the soil and acidifying the irrigation water. Harold appreciates how the cooperative efforts between Extension, research station scientists, and other agencies are proactive, thus preventing future problems from occurring.

Growers,
researchers,
and Extension
agents work
collaboratively
to address
current
problems.

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Sweet corn growers aren't the only people who benefit from this type of collaborative research. Studies are being conducted across the state to learn more about onions, alfalfa, canola, field corn, dry beans, mountain meadows, and small grains.



The small and controlled plots at AES research centers are excellent sites for many of the studies, but researchers also need multi-acre plots necessary for pesticide trials. In that scenario, area growers provide parcels of their own farmland for the projects. Pesticide studies are conducted to answer both immediate and long-term concerns so researchers can evaluate environmental impacts; how weather patterns effect the chemicals; the appropriate times and amounts to spray; and when or how pests and diseases develop resistance to the formulas.

In the end, the data gathered from these studies is communicated to pesticide manufacturers to help them create more effective pesticides; to chemical applicators for more efficient spraying; and to the producers themselves so they can yield the best possible crops and, therefore, reap the highest profits. With their involvement, producers become yet another partner in the efforts toward successfully managing agricultural lands and producing affordable and attractive food.

Similar partnerships abound involving a variety of projects which ensure that our food, environment, and backyards are healthy and beautiful. A sample of the kinds of work being conducted between Extension and AES agents include:

- offering technical training and hands-on pruning workshops for Colorado master gardeners,
- reclamation work on mill tailings in Leadville,
- training migrant workers for pesticide use and to understand worker protection standards, and
- educating ranchers on feed and pasture issues during times of drought.

In most cases, the team of agents and scientists from the different arms of the University relies heavily on producers, industry-related businesses, and even retailers. This promises that the tax dollars paying for the work will give farmers the greatest return on their investment and consumers the best, safest, and most affordable products and services.

– Leigh Fortson

Pictured on front: Brad Koch, Raj Khosla, and Bruce Bosley inspect corn near Brush, Colorado.

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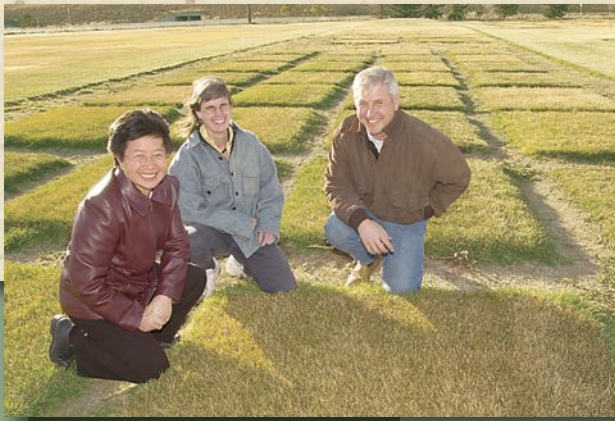
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Cooperative Extension, Agricultural Experiment Station, and Growers Collaborate

It's not enough to plant a crop and hope for the best. Colorado State University capitalizes on Extension's ability to network and bring growers together with the scientists. With this union, Extension and Agricultural Experiment Station can look at how best to resolve the high pH levels in soils and irrigation water around the Uncompahgre Valley that prevent plants from taking up adequate nutrition. This kind of collaboration is being considered for studies with onions, alfalfa, canola, field corn, dry beans, mountain meadows, and small grains.



The Grass is Always Greener

Manure Generated by Cattle Enhances Gardens and Landscapes

Sunny and dry Colorado offers a great environment for raising cattle but can be a challenging place for growing a lawn. Colorado State University professor of soil science and Cooperative Extension soil specialist Jessica Davis, associate professor of turfgrass science and management Yaling Qian, and professor of animal science and Extension feedlot specialist Tim Stanton are working together to show exactly how the manure generated by cattle can enhance suburban gardens and landscapes. (Pictured from left are Qian, Davis, and Stanton.)

Nearly 89,000 acres of agricultural land are developed along Colorado's Front Range annually, and about one-third of this area, or 29,653 acres, is estimated to be planted with turf every year. Front Range soils naturally tend to be heavy and clayey, and are easily compacted during construction. They also tend to lose their topsoil, making them very difficult to landscape or garden. Compost can help restore these soils. "Composted manure is great for landscaping," Davis says. "Turf represents one potential high-value use for composted manure."

Davis and Qian, along with graduate student Grant Johnson, are studying the benefits of using manure as top dressing on turfgrass. They have concluded that compost application at a rate of 35 cubic yards per acre improved turf quality and increased clipping yield over no treatment at all, and two annual applications of manure at this level eliminated the need for synthetic fertilizer to maintain a good-looking lawn. As manure and compost are the best natural, organic sources of phosphorus for Colorado's high pH (basic) soils, applying composted manure rather than chemical fertilizers could be a very attractive

lawn care option for consumers interested in organic products.

The research team also is investigating how turfgrass top-dressed with composted manure responds to drought. A dry period was imposed on the turfgrass test plots. One week after the dry period had started, plots treated with 35 cubic yards per acre of compost had higher levels of soil moisture and lower turfgrass canopy temperature than untreated plots. The compost increased soil water-holding capacity and reduced drought stress on established turf. The compost treatments even helped one variety of turf, a drought-sensitive bluegrass, to maintain its quality during the simulated dry spell. "These beneficial results have important implications in Colorado, where water conservation is of critical importance," Davis says. "Homeowners and turf managers can conserve water and save money on their water bills."

To make manure safe for use in the landscape, it must be composted. "Composting is a managed microbial process," Davis explains. "The microbes need carbon, nitrogen, water, and oxygen in order to compost well. When the composting process proceeds correctly, temperatures will rise to 140 to 150 degrees Fahrenheit. These high temperatures kill pathogens and weed seeds in the manure. The entire composting process can take up to six months, depending on the intensity of the management."

However, even when composted correctly, some manure sources are better than others. Due to the diets of some animals in feedlots, some composts have relatively high levels of salt that can hinder seed germination and slow plant growth. The Colorado State University research team is addressing the problems

Homeowners
and turf
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posed by salts in manure. Stanton uses his role as Extension feedlot specialist to explore methods of reducing the amount of sodium in manure by changing the diets of cattle in the feedlot. The industry standard is to supplement the food of feedlot cattle with 0.25 percent sodium chloride. Stanton and the team compared cattle treated in this standard way with cattle that were given no sodium chloride, cattle that were offered free access to a salt block, and cattle that were given a 0.125 percent sodium chloride supplement. After feeding on these diets for six months, the cattle were harvested, and their carcasses were evaluated. The cattle with the different amounts of sodium chloride in their diets performed the same as the cattle fed the standard supplement when evaluated by average daily gain, feed intake, and feed efficiency. However, the sodium levels in the manure were significantly reduced by lowering the sodium chloride levels in the food fed to



the cattle. Therefore, removing salt from the rations of feedlot cattle could reduce sodium levels in manure and increase the horticultural value of manure without having detrimental impacts on cattle performance.

As the benefits of composted manure are proven to homeowners and landscape professionals, it is Davis' hope that the market for compost may rise, giving feedlot operators and small-acreage horse owners an incentive to compost manure. Manure shouldn't be a disposal problem as it sometimes is now, particularly when it has such high potential to keep urban and suburban landscapes beautiful.

– Leslie Patterson

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Colorado State University Collaborates with Composters

In the past year, a group of local composters has joined together to form the Rocky Mountain Organics Council (RMOC). Their first order of business has been to develop compost quality standards to help consumers evaluate a compost and its potential uses.

Salinity levels are one of the key factors in evaluating compost quality. When salinity levels are too high, the RMOC recommends that compost not be used on salt-sensitive plants, like ornamentals. Another factor that contributes to compost quality is compost maturity, which is measured through both carbon to nitrogen ratio and germination tests.

Colorado State University has been at the table with RMOC aiding in the development of the quality grades from the start. In addition, research associate Kathy Doesken has just finished drafting a fact sheet on the compost grading system for consumers, and research associate Addy Elliott is planning a workshop to train composters and agricultural professionals in February. Colorado State and RMOC also are working together to seek funding for additional research in the area of compost quality and use. The relationship between Colorado State and RMOC is just one example of how the University supports partnerships to encourage local businesses and agricultural sustainability.

For more information on RMOC, visit the Web site at <http://www.cafr.org/membership/rmoc.htm>.



Hanging Pathogens Out to Dry

Getting the Word Out on Food Safety with SafeFood Rapid Response and Information Network

Pat Kendall, Cooperative Extension specialist and professor of food science and human nutrition (pictured, left), has always been interested in health and food, but her research on food safety has also made her very familiar with the language of pathogens and viruses. *Escherichia coli* (*E. coli*) O157:H7, *Listeria monocytogenes*, *Salmonella enteritidis*, *Salmonella typhimurium*, and Norwalk virus (norovirus) are all essential words in her vocabulary. Fortunately, Kendall doesn't expect everyone to be able to pronounce these pathogens, but she does want everyone to know how to avoid an illness from them.

Food safety is a major problem in the United States. Although it's estimated that only one in 10 food-borne illnesses is documented, Centers for Disease Control and Prevention (CDC) statistics indicate that 76 million people in the United States are adversely affected by food-borne pathogens in any year, resulting in 325,000 hospitalizations and 5,000 deaths. These illnesses are particularly dangerous to the elderly, young children, and those with compromised immune systems.

Food-borne illnesses can be linked to contaminated beef, poultry, seafood, eggs, and produce. "Outbreaks associated with meat may get more publicity because of large recalls, but produce-related outbreaks almost match the number of illnesses linked to contaminated beef, poultry, seafood, and eggs," Kendall says. In fact, in 2000, there were 3,981 reported illnesses associated with contaminated produce and 4,025 linked to the other foods mentioned.

Pathogens appear in surprising places, like home-dried foods. For years, it was assumed that the low moisture content in dried foods precluded the growth of microbes, but research has shown that *E. coli* O157:H7 and *Salmonella* can survive basic drying methods. Kendall, along with professor of animal sciences John Sofos (pictured, right) and Ph.D. candidate Patricia DiPersio, has developed some procedures for safely drying foods. They appear in a new Extension publication entitled *Drying Foods: Dehydrating Fruits, Vegetables, Leathers, and Jerkies*.

"The recommendations in the publication concern how foods that are about to be dried can be pre-treated to enhance the destruction of pathogens," Kendall says. The research team tried various pre-treatment methods including blanching, immersing in salt solutions, and immersing in acidic solutions. By examining the vegetables, fruit, and jerkies about a month after they had been dried, Kendall and other investigators came to several conclusions. For both fruits and vegetables, pre-treating them with an acidic solution enhances the destruction of potentially harmful microorganisms during dehydration. For vegetables, water blanching in a solution that contains ½ teaspoon of citric acid per quart of water is recommended to increase pathogen death and improve general quality. A vinegar dip or ascorbic acid treatment should be used on meat prior to marinating for jerky. Safely drying foods involves pre-treatment, sufficiently heating the food to draw out moisture, exposing the food to dry air to absorb moisture, and allowing for proper air circulation to carry off moisture. These processes provide multiple hurdles that together enhance microbe destruction.

Produce-related outbreaks nearly match the number of all other contaminated food illnesses combined.

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Publications are only one way Kendall gets the word out on food safety. She also writes a weekly column that appears in 22 newspapers, co-edits the *SafeFood News* online newsletter, oversees a subscription-only listserv that sends out food alerts, and provides training for Extension agents, master food preservers, and the Women, Infants, and Children (WIC) program. She has also been instrumental in developing a Web-based, multimedia continuing education program for nurses, dietitians, and Extension agents on food safety issues for high-risk audiences.

Kendall's message may become even more imperative. "We didn't worry about Norwalk virus three years ago," Kendall says, referring to a pathogen that recently sickened diners at a Fort Collins steakhouse and that has generated news stories concerning outbreaks on cruise ships and care facilities. "The symptoms of Norwalk, vomiting and diarrhea, aren't particularly long-lasting, but an infected person can still be a carrier of the virus even three days after the symptoms disappear." This prolonged infectious period, Kendall explains, can be particularly problematic in a restaurant situation, in which the employer wants to keep

the restaurant staffed, the employee wants to earn a paycheck, and outbreaks potentially can spread to a far greater number of people than is possible in a home kitchen situation.

Norwalk virus may seem particularly dangerous because it can land on any surface, but even a microbe like *E. coli*, whose original source may be in the gut of an animal, can easily cross-contaminate non-meat items without proper sanitary practices. "Furthermore, there is evidence that several strains of pathogens are becoming more virulent," Kendall warns. "Microbes like *E. coli* O157:H7 are learning to survive in severe environments."

Fortunately, Kendall and Sofos are committed to researching food-related health risks. Simple practices like hand washing, washing all produce with cold water before eating, keeping things refrigerated, and cleaning cutting boards, utensils, and refrigerators can significantly help protect health.

– Leslie Patterson

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SafeFood: From Farm to Fork

Are free-range chickens safer to eat? At what temperature should a refrigerator be kept? Is there any truth in the five-second rule? Some fascinating and fun questions are asked and answered by *SafeFood News* (<http://www.colostate.edu/Orgs/safefood/NEWSLTR/menunews.html>), the online newsletter produced quarterly by Colorado State University Cooperative Extension.

SafeFood News is part of the SafeFood Rapid Response and Information Network, a Web site designed to help consumers and producers make informed decisions by providing objective, research-based information about food production and safety issues. In an entertaining, down-to-earth style, the newsletter explores topics ranging from Food and Drug Administration warnings to urban legends surrounding food.

The Fall 2004 newsletter described an investigation in which a Georgia researcher discovered that 25 percent of the 100 free-range chickens he examined tested positive for Salmonella, matching the rate of conventionally raised chickens. An article in the Winter 2004 issue on food storage said that refrigerator temperature should be between 35 and 40 degrees Fahrenheit. And in Spring 2004, research was described on the five-second rule – a piece of folklore that holds that if something is dropped on the floor it is still safe to eat if it is retrieved within five seconds. In this case, a high schooler doing an apprenticeship at Hans Blaschek's University of Illinois laboratory, examined cookies and gummy bears dropped on tiled floors. Under a high-power microscope, she discovered that food could become contaminated with only five seconds of contact with inoculated tiles.



Market-Fresh

Growers Embrace Value-Added Products, Niche-Marketing, and Direct Marketing

Dawn Thilmany (pictured, left), associate professor of agricultural and resource economics at Colorado State University, is dedicated to taking a fresh look at marketing foods. Thilmany grew up on a big but financially struggling farm in Iowa. There, she learned a model of agriculture where the producer didn't have much control over marketing. "But there are other models," she says. "Growers can choose to take control over their destiny by investing more in marketing." Her research and Extension activities show that there is more than one way to market food.

Thilmany stresses that the traditional, big business model of agriculture is not bad in itself, but it's always good to have choice. She feels that her work can help small producers gain access to markets. "It's become a pretty concentrated agricultural industry in the United States, and if you're not a big producer, it can be difficult getting into certain wholesale markets," Thilmany says. "If we can do research that investigates how to gain access to different markets, what share of the market wants to buy products differentiated in a certain manner, and what kind of premium consumers are willing to pay for the product, growers can determine whether they will pay to invest in new enterprises or change current enterprises to include different production practices." Some of the practices that growers might choose to invest in include processed value-added products, niche-marketing, and direct marketing.

Most people think of value-added products as an actual change in the product, such as turning apples into apple juice,

but Thilmany points out that a value-added product can be anything that is done to a product that increases its market value. For instance, getting an eco-label or organic designation on a product or having a product labeled as Colorado-grown might increase its value.

With niche marketing, the grower capitalizes on the unique aspects of a product to appeal directly to certain consumers. Probably the dominant niche-market is organics. But in addition to organic certification, Thilmany predicts that consumers may soon see a variety of certifications – for instance, a certification for humane treatment of animals and an American Viticultural Area (AVA) designation for Western Slope wines. AVAs are geographic locations where the climate, soil, and elevation are assumed to give wines a certain characteristic. Although an AVA does not indicate anything about the quality of a wine, Western Slope grape growers should benefit from having an officially designated AVA.

Growers cut out the middle person when they market their products directly to consumers. The farmers market is a classic example of direct marketing. Thilmany's colleague Adrian Card (pictured, right), Extension agent for Boulder County, claims that Colorado has experienced a higher growth rate in the number of farmers markets than other regions of the country. There are now more than 80 farmers markets in the state. However, Thilmany wants to be sure that growers who choose to direct market are aware of the challenges involved.

"If you're going to market directly as a large part of your marketing plan, you have to be as serious about investing in marketing and

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Knowledge to Go Places

communication resources as you are about production,” Thilmany warns in the speeches she delivers around the state through Cooperative Extension.

“Many people get into careers in agriculture because they love the production aspect of farming,” says Thilmany, but for success in direct marketing, they need to bring the same enthusiasm and work ethic to developing business plans. For his part, Card feels that producers are hearing Thilmany’s message: “I see more farmers approaching their work by looking at the marketing side first and working backwards, and that’s good.”

Thilmany and Card are anxious to let farmers know that there are lots of marketing choices out there. There are diverse reasons customers buy a certain product. For instance, there is no one group of consumers that buys organic food. People choose to buy organic for different reasons. Some formulate their choice based on environmental ideas, others on health concerns. Many parents make the decision to buy organic in order to promote nutrition in their childrens’ diets.

Similarly, Card explains all consumers who buy locally don’t do it for the same reason. Some customers want to buy locally produced foods because they want to keep agriculture and open space in their



communities. Others want the benefits of the dollar they’ve spent to stay in their neighborhoods. Still others derive comfort and satisfaction from talking face-to-face with the farmer from whom they are buying their food. Then there are the “foodies” (self-proclaimed fans of the Food Network) and proponents of the Slow Food movement that agriculture is a culture: Food and agriculture are things that can enhance their quality of life just like art.

Thilmany hopes to market to all of these reasons by helping farmers create good business plans. Choice can make happy producers and consumers. With an agricultural system that makes room for a variety of different ways to market food, consumers are satisfied because they can make an informed choice about the foods they buy, and producers are happy because they can charge a fair price for a product they produce using techniques they believe in.

– Leslie Patterson

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From Crop to Cuisine

Colorado Crop to Cuisine (CCC) is designed to connect farmers with restaurant chefs and increase market opportunities for local producers of fruits, vegetables, herbs, artisanal produce, and lightly processed foods. The Colorado Proud program, which received a 2002 Governor’s Award for marketing, acquaints agricultural producers with Colorado chefs and coordinates orders and delivery of locally grown products to restaurants. No particular attributes about the product are advertised except that it is locally grown and that there is a 24-hour turnaround between harvest and delivery to the restaurant.

Yet the program is a boon to growers, chefs, and consumers alike. By joining CCC, farmers are able to easily diversify their marketing portfolio; chefs get to work with the freshest products and advertise menu items as locally grown; and consumers get to enjoy fresh tastes and become familiar with foods they might not have tried before. Certainly, even a short list of foods available through the program – raspberries, tomatoes, herbs, onions, peppers, natural pork, and peas – is enough to make any food lover’s mouth water. (For more information on CCC, visit <http://www.geocities.com/coloradocrop>.)