UNIVERSITY OF NEVADA
COOPERATIVE EXTENSION (UNCE)
&
NEVADA AGRICULTURAL EXPERIMENT STATION (NAES)

Annual Report
of
Accomplishments & Results

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PROGRAMS

PROGRAMS

Overview and Introduction:

Reports are only provided on select program impacts which reflect unique benefits to a diversity of clientele and stakeholders in Nevada. No attempt was made to include all programs or all program impacts since they are too extensive. All programs are based on local or statewide needs assessments.

It should be noted that just about all Cooperative Extension programs have some type of applied "research" component. Cooperative Extension faculty are expected to research needs, program impacts, and may use applied research projects to learn new information as well as a teaching tools. All Cooperative Extension faculty must have at least these minimum research components in their programs, and research is a major consideration in annual evaluations for both field faculty and campus based faculty (many of whom also have joint Nevada Agricultural Experiment Station appointments as well). Finally, a number of Cooperative Extension faculty also participate on NAES research projects.

The research programs of the NAES are integral to the College of Agriculture, Biotechnology and Natural Resources and are associated with the College of Human and Community Sciences, and the School of Medicine. The mission of NAES is to build and support research capacity to advance understanding of biological, environmental, natural resource and social systems to enhance agriculture, community and economic vitality in compliance with State and Federal Legislation. Research is conducted in the laboratories of the Max C. Fleischmann College of Agriculture, Knudsen Resource Center, Howard Medical Sciences, Bureau of Mines building, and the Sarah Fleischmann College of Human and Community Sciences. Six field laboratory sites are also utilized for research, including: Main Station Field Laboratory, which houses the large animal surgical facility and laboratory and the meats laboratory; Valley Road Field Laboratory, which houses the College of Agriculture Equestrian Center; Newlands Research and Extension Center; Gund Ranch Rangeland Research Center; Rafter 7 Ranch Sheep Research Station; and the Jay Dow Sr. Wetlands Research Laboratory.

GOAL 1: AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

Overview: Our Plan of Work (POW) goals are to increase the overall quality and health of Nevada livestock through research and outreach, to understand the quality of plants through basic research and to evaluate and promote improved marketing of Nevada products.

University of Nevada Cooperative Extension (UNCE) education programs have focused on diversified/alternative crops, risk management and animal production efficiency. UNCE campus and field faculty are also part of many NAES research projects in these subjects, and have made extensive use of research findings. As noted in some of the key themes, the dissemination of research information via UNCE educational programs has had an impact on producer's practices and profits.

NAES research programs have focused on developing alternative crops for Nevada, determining genetic and nutrition factors to enhance the quality of beef products, improving beef cattle reproduction rates to increase profitability, rangeland rehabilitation, improving the economic return in sheep production by emphasizing both wool and meat production and finding niche markets for specialty meat products.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**I**	**267,949 11%**	**2,086,186 89%**		**2,354,135 21%**	**33.7**
University of Nevada Cooperative Extension	**I**	**311,464**	**1,542,657**	**1,658,3,512,134**	**3,512,134**	**34.21**

Theme: Invasive Species (Weeds)

Issue:

Weeds are one of the most serious threats to Nevada rangelands and lawns. Noxious weeds have already invaded thousands of acres of Nevada's lands and waterways.

What Has Been Done:

Hundreds of Weed Warriors, Woad Warriors, and other volunteers have been trained by University of Nevada Cooperative Extension (UNCE) personnel in how to spot, control and eradicate noxious weeds. There are numerous activities every spring in which weed volunteers pull and/or spray hundreds of acres of noxious weeds. These volunteers:

- Educate their neighbors and other local residents about the threat of noxious weeds. They make presentations, staff booths, write media articles and give tours.
- Identify weeds and map infestations. They develop databases and monitor the infested areas.
- Control and eradicate weeds. They conduct weed pulls and apply herbicides to large infestations.

Partners include the Nevada Department of Agriculture, Bureau of Land Management, Natural Resources Conservation Service, U.S. Fish and Wildlife Foundation and U.S. Forest Service.

Impact:

Many local weed volunteer groups have formalized their groups into coordinated weed associations throughout the state. There are more than 30 Nevada coordinated weed associations and other groups, according to the Nevada Department of Agriculture's Weed Coordinator. UNCE plays an active role in many of these groups, serving as catalysts, educators and grant consultants. The goal is to achieve long-term sustainability of the weed control efforts. In just one instance, the Spring Creek Weed Action Team in Elko County raised $15,000 to support weed control efforts, and Dyer's Woad was reduced along roadsides and in lawns.

The Truckee Meadows Weed Group marketing campaign was successful in increasing weed reporting calls to the hotline by 475% from 0 in May, 2004 to 4 in June, to 19 in July during the height of the outreach campaign. All reports were addressed by Washoe County's weed SWAT team. In addition, more than 2,000 acres of weeds were mapped and controlled by City of Reno and Washoe County staff.

As a result of coordinated efforts by the Tahoe Weed Group, nearly 2,000 miles in the basin were surveyed, 157 previously mapped infestations were treated, and 161 new weed infestations were documented and treated. Fewer new weed infestations are popping up, indicating the groups are beginning to effectively find, control and prevent the spread of weeds at Lake Tahoe.

Source of Funding;

Smith-Lever
State Matching Funds

Scope of Impact:

State specific
Integrated Research & Extension

Theme: Managing Change in Agriculture

Issue:

Range livestock producers operate on a narrow profit margin, so taking advantage of new technology is imperative to their financial success. The University of Nevada Cooperative Extension (UNCE) Coffee Shop email exchange functions as the vital link between producers and information they need.

What Has Been Done:

UNCE faculty have taken the traditional producer coffee-shop discussions into cyberspace. Extension Coffee Shop is a national subscribed email list of more than 250 producers designed to provide a two-way communication network for livestock producers. The online system is a question-and-answer service that relays answers to livestock production and marketing questions. The question and answer are then relayed back out to all email subscribers. When one producer has a question, all other subscribers benefit from the answer. The program also allows ranchers to chat online not only with UNCE specialists, but also with other experts and producers. Producers stay on the cutting edge of the cattle industry and get up-to-date production and marketing information right in their office.

To subscribe, producers send an email message to torellr@unce.unr.edu; once registered, questions are sent to extensioncoffeeshop@unr.edu

Impact:

In 2004, UNCE conducted a survey among the Coffee Shop subscribers, designed to measure knowledge gains and improve the effectiveness of electronic communications as an educational tool; 39% completed the survey. Eighty-four percent of producer respondents indicated the program was effective or very effective in helping their ranching operations make money. Ninety-four percent of ranchers said the program keeps them up to date on important issues; 87 percent improved their knowledge of herd health management practices. BSE ("Mad Cow") disease and Hantavirus were two issues that received the highest score in knowledge gained. Eighty-eight percent of producers indicated the service helped them make important decisions in their ranching operation. Ninety-six percent of all respondents indicated information presented on Coffee Shop is clear and concise, and the same number indicated the information presented is accurate, researched-based information. All professional respondents said the service helped them make better decisions in their profession, and it helped keep them in touch with rural agriculture needs. Eighty-five percent of all respondents print Coffee Shop information and share it with others.

Source of Funding;

Smith-Lever
State Matching Funds

Scope of Impact:

Multistate Integrated Research & Extension (CA, OR, NV, ID)

Theme: Urban Gardening/Horticulture

Issue:

Nevada is one of the fastest growing states in the nation and many new residents do not know how to garden in these arid land conditions. Experienced and novice gardeners from around the country have trouble growing plants and vegetables in Nevada. There is a great need to assist these new neighbors, and there is also a big demand for plant-science knowledge from long-time citizens.

What Has Been Done:

Master Gardeners – educated by University of Nevada Cooperative Extension (UNCE) professionals -- provide research-based horticulture information to the increasing population of Nevadans. They are local volunteers who learn advanced plant science skills through at least 50 hours of classroom instruction. Then, the student gardeners volunteer a minimum of at least 50 hours a year by giving their newly acquired knowledge to

other citizens. Master Gardeners educate through the media, give talks and workshops, answer phone calls, send out informational materials, develop community gardens and teach in the schools, at garden clubs, senior centers, hospitals, childcare centers, nurseries and farmers markets.

The Junior Master Gardener program involves youth, in school or after school, who learn the principles of plant science and horticulture. Leaders have been trained in Las Vegas and Carson City to conduct the program, which consists of gardening curricula for different age levels of children. A number of other subjects, including English, science and math, can be taught through gardening activities. The program has been accepted as an after-school activity in the Clark County School District.

The Master Gardener program is also available to some prison inmates to help them with career development. In 2004, two prison classes graduated 29 people, who passed the same final exam. Gardens have also been established at these facilities and others.

In northern Nevada, Master Gardeners grow fresh vegetables and donate fresh vegetables and fruits to local food kitchens in the Harvest for the Hungry program. They also participate in home shows, tree and shrub sales, a plant faire extravaganza, greenhouse program, home builders show, State Fair, Christmas tree recycling and the GROW highway landscaping program.

Impact:

There are nearly 600 active Master Gardeners statewide. In 2004, they handled nearly 13,000 phone calls requesting horticulture information, and forwarded emails and mailed out requested publications. Master Gardeners volunteered more than 31,000 hours around the state educating people in plant-science, the equivalent of 17 full-time employees.

A 2004 prison class, responding to a series of questions concerning the effects of the program, indicated a strong perceived benefit. Of the 29 prisoners participating, all but one passed an examination virtually identical to that taken by regular Master Gardener trainees. Thirty inmates became certified in 2004, and the program will be continued at other correctional facilities. At Nellis, members of a 2004 class designed a landscape plan they will install at the Air Force Base in 2005. On a scale of 1 to 5, inmates rated the program worthwhile at 4.71, and would recommend the program to other inmates at 4.76.

Source of Funding;

Smith-Lever
State Matching Funds

Scope of Impact:

State specific

<u>Theme: Plant Genomics/Niche Market</u>

Issue (Who cares and why?)

Nevada's arid climate makes it hard for farmers to grow non-native crops. Many farmers in the state rely on alfalfa as their main crop. While alfalfa grows well in Nevada, it uses about 3.5 acre-feet of water per acre each season. That is, more than 1.1 million gallons of water for 1 acre of alfalfa. Nevada's farmers need a crop that grows as reliably as alfalfa, but uses less of the state's limited water supply. Researchers know that wine grapes use little water, but overcoming the challenges of Nevada's harsh climate needed some serious help.

What has been done?

Over the past eight years, the University of Nevada, Reno (UNR) has established experimental vineyards in Reno, Minden/Gardnerville, Fernley, Fallon, and Yerington, Nevada to test regional micro-climates effects on grapes. UNR is using several different approaches to developing more stress tolerant wine grape (*Vitis vinifera*) plants including: adapting cultural practices; selecting for more tolerant plant cells; making hybrids of *V. vinifera* with more tolerant native North American species; and using genetic engineering technology to develop more

hardy genotypes. In the summer of 2003, the University constructed a research winery at the Valley Road field station. In 2004, the Valley Road Winery opened its doors to the public, offering tastings of 10 varieties grown and produced at the facility.

Impact

The initial success of the UNR vineyard has generated considerable interest in nearby areas. Northern Nevada can produce excellent quality wines. The sugar to acid ratio of the grape musts for many of the varieties reached the optimum quality value of 30, says Jason Evans a UNR biochemist and a wine aficionado. This past year UNR opened it doors to Northern Nevada's wine tasting community. "The response was overwhelming with more than 250 in attendance our first day", claimed Jean Carbon a development officer at UNR. Fran Healy a self proclaimed wine expert, while attending the Reno/Tahoe Wine, Food and Jazz Festival, sampled her first glass of Nevada wine. She said, "I really enjoy a good sweet wine that is unique while adhering to traditional expectations, the Gewürztraminer won hands down. I could see this as a Reno boutique wine." Dr. Grant Cramer the lead scientist on the projects likes to point out that "The net profit on an acre of alfalfa is about $300, the net profit on a one-acre vineyard in Grand Junction, Colo., is $5,000."

Funding Source

USDA - Hatch Act
State Matching Funds

Primary Impact Area(s)

State Specific

Theme: Grazing

Issue (Who cares and why?)

A major portion of Northern Nevada has burned over the past several years, severely reducing production capability and greatly impacting natural resources. Reducing the problems caused by the burned areas down to their least common denominator most will agree that three factor always remain. In the short term, the problem is supplying forage to livestock that grazed these lands. For the longer-term, the problems are rehabilitation and prevention of future fires.

While it is standard practice to delay grazing on all burned areas for several years, there is no definitive proof that this is necessary. Depending on the burn intensity, plant growth can be rapid in a short period after a fire and the grazing deferment may not be as necessary as BLM doctrine prescribes. Seeding as a rehabilitation process is a logical conclusion. However because of the large areas affected, and different burn intensities, 100% seeding coverage may not be necessary. Nature has a large capacity to rejuvenate itself. In areas less susceptible to cheatgrass infestation, or where dust problems do not occur, seeding may neither necessary nor desirable. This project investigates the results of seeding and not seeding and subsequent timing of grazing, in a variety of ecological settings.

What has been done?

The study area is a fire impacted BLM permit site. The affected area was divided into 4 large blocks for multiple research purposes. Each of the pastures had similar representatives of vegetation, soils, topography, riparian areas, fire intensity, precipitation zones, and historical wildlife and livestock use. The major design components are seeded and unseeded areas and grazed and ungrazed areas. The grazing treatments were implemented in year one after the fire. Stocking rate were designed to achieve 50 percent utilization. Approximately 200 AUMs were used, although this number fluctuated to match the forage produced due to rainfall and growing conditions. Varying the number of cattle and the time they are allowed to graze were used to achieve the 50 percent utilization rates. Representatives from UNR and BLM worked together to collect the monitoring data to ensure useful data for both

parties. Animal (weight change, body condition score change for both cows and calves in cow/calf pairs), vegetation (primary productivity, plant density, plant cover, species composition), and economic performance (cost return analysis, comparison impact analysis, firm to community level impacts) criteria were used to evaluate the relative success of the treatments. These criteria will provide the basic information to answer some of the questions concerning timing of grazing and fire rehabilitation procedures, as well as suggest future areas of research.

Impact

Unprecedented wildland fires have had major impacts on vegetation systems throughout the Great Basin. Nursing northeastern Nevada, as well as other burned states, back to ecological health will be a monumental task requiring ongoing commitment from the public, land users and governments as well as long-term funding. However, to accept the status quo of "No Grazing for 3 Years" without proper scientific proof, could potentially bankrupt many ranchers dependant on BLM grazing permits.

Our research shows that much of Nevada's burned rangeland could sustain grazing with no significant losses to plant diversity or density. It also indicates that the value of output per AUM to be $35.35. This value corresponds to the dollar amount that each AUM contributes to the range cattle sectors total gross value of production (or gross value of output). The total AUM's lost due to wildfire in the five hardest hit counties during 1999 wildfires are estimated to be 133,819, resulting in a direct impact to the livestock sector of $4,730,051. Much of this cost could have been avoided if BLM's blanket strategy was not employed.

Primary Impact Area(s)

State Specific

Funding Source

State Matching Funds
CSREES - Nevada Arid Rangeland Initiative

GOAL 2: SAFE AND SECURE FOOD AND FIBER SYSTEM

Overview: Our POW goal is to conduct research and outreach programming to prevent food borne illness in Nevada.

Data from Nevada research has been incorporated into the Nevada Beef Quality Assurance Program as well as the Hazard Analysis and Critical Point (HACCP) management program to improve consumer confidence in Nevada's beef industry. Food safety is also a part of all nutrition and food preparation training conducted by UNCE under Goal 3.

UNCE faculty were instrumental working with the Nevada Cattleman's Association to introduce and teach education programs related to the Beef Quality Assurance Program to help improved food safety. In the past year, the Beef Quality Assurance has expanded in numbers, and to the next level of certification among producers.

NAES research has focused on livestock health and improved nutritional quality of meat products.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**II**	**293,331 31%**	**642,653 31%**		**935,984 7%**	**9**
University of Nevada Cooperative Extension	**II**	**33,605**	**166,442**	**178,887**	**378,934**	**3.24**

Theme: Food Quality/Food Safety

Issue:

Bovine Spongiform Encephalothapy (BSE) was discovered in the United States in 2004, which stopped exports of U.S. meats. Food-borne diseases, such as E. coli-contaminated meat, sicken thousands of American consumers annually. The American consumer has demonstrated that the safety and quality of the food they eat is one of their top priorities. Thus, Beef Quality Assurance (BQA) has become a national initiative of top priority to the National Cattlemen's Beef Association (NCBA), Nevada Cattlemen's Association and Cooperative Extension systems throughout the nation.

What Has Been Done:

BQA programs teach cattle ranchers in all 50 states about animal genetics, cattle handling, feed purchasing, record keeping, testing and other procedures to produce beef without residue of animal health products or pesticides. Since 2000, University of Nevada Cooperative Extension (UNCE) has taught safety and quality assurance practices to more than 500 Nevada beef producers in workshops, during conventions, via distance education and in chute-side, on-ranch situations. UNCE specialists use a 44-page, Nevada-based BQA reference book, computer technology and an informational CD produced by the NCBA, to teach BQA principles. Participants work closely with veterinarians, scientists and other specialists to keep cattle healthy, improving overall quality and consumer confidence.

Local partners include the Nevada Beef Council, Nevada Cattlemen's Association and Nevada Department of Agriculture.

Impact:

Nearly 300 Nevada cattle producers have received national level 1 certification in the BQA program; more than 60 have become level 2 certified. By becoming BQA-certified, producers sign an affidavit that they will implement and follow the guidelines taught in the educational program. Western Video and Superior Livestock, the two auction houses that sell more than 80% of Nevada cattle, list cattle as Nevada BQA-certified on consignments originating from BQA-certified ranches. Producers feel a better demand is realized for cattle processed under BQA guidelines. This program is having an impact on the way cattle are processed and marketed. A post survey conducted by the Nevada Cattlemen's Association shows that 90% of participants who became certified have changed the way they process cattle. The Nevada BQA program is part of a national effort, which has resulted in a 25% reduction in the amount of injected site lesions due to improper vaccination protocol on beef cattle.

Source of funding:

Smith-Lever
State matching funds

Scope of Impact:

Multistate Integrated Research and Extension (ID, CA, UT)

Theme: Food Resource Management

Issue:

Muslims follow a set of rules as to what they eat in their diet. These rules specify the food that is Halal, meaning lawful and must be slaughtered according to Islamic Rites. Wolf Pack Meats is certified by the Islamic Society of North America to be in strict compliance with Islamic law, at every stage of its lamb production and processing operation.

The University of Nevada has found its self in a unique position when balancing research with refuse accumulation. Using sheep as models for human gene therapy and stem cell research, as many as 30 animals per week are culled. The issues arises after culling. What is to be done with the carcasses of old sheep?

What Has Been Done:

After being approached by Reno's Islamic leader, Mike Hendi to consider preparing a portion of the products produced by Wolfpack Meats, the processing plant under went a religious purification. Training was provided by local clerics. The procedure is as follows: the animal must be slaughtered by a Muslim. The animal should be put down on the ground and its throat should be slit with a very sharp knife to make sure that the 3 main blood vessels are cut. While cutting the throat of the animal (without severing it), the person must pronounce the name of Allah or recite a blessing which contains the name of Allah, such as "Bismillah Allah-u-Akbar".

Impact:

Consumers will find the new Halal food choices in two different areas in their grocery stores: the fresh and frozen sections. "We want to help Northern Nevada's growing Muslim community meet challenges of today's lifestyle," noted Wolfpack Meats manager Bob Butler. "First we heard from Muslim consumers that they wanted Halal products that they could use as the starting-point for traditional cuisines." They will now have the flexibility to create a broad range of dishes because of the choice of fresh and frozen meats that Wolfpack Meat offers.

Consumers were also clear that they wanted to obtain their Halal food in convenient mainstream grocery stores, so we introduced a striking new labels and put the foods into local grocery stores" said Mr. Butler. Mike Hendi a local Islamic leader claims that "Muslims are grateful to finally have a choice in Reno". " The shear savings of not having to drive two hours one-way to purchase Halal products is a blessing". If you were to figure in travel cost to make their Halal purchases at the federal rate of 36.5¢/mile, a 240 miles trip would run the driver $87.6 per trip.

Primary Impact Area(s)

State Specific

Funding Source

State Matching Funds

Theme: Foodborne Pathogen Protection

Issue (Who cares and why?):

In 1982, the clinical importance of verotoxin-producing Escherichia coli (VTEC) was recognized when E. coli 0157:117 was isolated from human stools during an outbreak of food-borne illness associated with the consumption of improperly cooked ground beef. Because slaughtered cull cows contribute significantly to the ground beef supply they are considered a food safety risk factor if they harbor VTEC.

It has become apparent that the epidemiology of food-borne diseases has changed rapidly over the past two decades as new pathogens emerged, well known pathogens increased in prevalence, and other organisms previously considered opportunistic pathogens have developed highly pathogenic strains. In order to protect today's consumers, considerable research is required to understand the life history of these pathogens and determine best management strategies that reduce infectious outbreaks.

What has been done?

The objective of this study was to assess the prevalence of VTEC in culled beef cows (Angus, Hereford, or their crossbreds) at the time of shipping to slaughter. Fecal samples were rectally collected from 82 culled cows (8 to 12 year-old) representing eight Nevada ranches with average herd size of 600 beef cows, of which 10 to 20% are culled annually. The cows grazed meadow rangeland forages (e.g., crested wheat grass, brome grass, and tall fescue).

By using high sensitive immunologic and genetic techniques, initial isolates were selected using classical microbiological methods based on sorbitol fermentation and MUG properties. Toxicity of the isolates was determined by performing verocytotoxicity tests. Cytotoxic isolates were detected in fecal samples from eight cows (one cow in each of two ranches; three cows in each of two ranches). Eighteen cytotoxic isolates were further characterized with the API identification system to clarify sorbitol fermentation. Five cytotoxic isolates matched

the classical identification of 0157:117 and four isolates were sorbitol negative but MUG positive. The remaining nine isolates were confirmed as sorbitol positive, one isolate was MUG negative, and eight were MUG positive.

The VTEC prevalence rate ranged from 0 (4 ranches) to 30% (1 ranch). These results demonstrate that the number of VTEC-positive cows differs within a herd and the cytotoxic isolates are of different characteristics. This suggests the importance of screening beef cattle for VTEC instead of limiting assays to 0157:117. By expanding the detection methods, chances of detecting E. coli are increased and possible on farm management practices that minimize the risk of beef contamination can be implemented. These practices should improve the safety of beef entering the food chain.

Impact:

Researchers at the University of Nevada are striving to identify and measure food-borne pathogens shed by cull beef and dairy cattle. Our examinations of local cattle suggest that approximately 22% of the range fed cattle on 50% of Nevada's ranches are host to these toxic pathogens. This research has also alerted us to growing number (we have now identified 60 types) of new toxic strains of bacteria in Nevada's beef cattle.

Our next step is to determine how grazing, forage type, water source, protein and concentrate feeding, antimicrobial feed additives, mineral supplements and environmental conditions affect the survival of these toxic bacteria. The results of this investigation will give researchers a pool of data that offers better understanding into interaction between pre-harvest feeding strategies and management practices that improve the health and well-being of consumers.

Primary Impact Area(s)

State Specific

Funding Source

Hatch

State Matching Funds

GOAL 3: HEALTHY, WELL NOURISHED POPULATION

Overview: Our POW goal is to conduct research to better understand healthy life style habits, and educational programs that focuses on learning and adopting healthy life style habits.

Many studies have documented the impact of nutrition on learning and health problems such as obesity among youth, diabetes, heart disease, hypertension and stroke among minorities as well as other adults. Therefore, major UNCE programs have been directed at improving the nutritional knowledge and eating behaviors of youth, especially those from minorities or limited resource families. Special efforts have also been made to reach minority audiences in these programs and examples are given below.

NAES research has focused on nutritional intervention strategies with dietary fat to assist in the treatment of human cancers and research on humanizing organs in sheep tissue through stem cell implantation.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**III**	**303,503 17%**	**1,444,461 83%**		**1,747,964 15%**	**28**
University of Nevada Cooperative Extension	**III**	**85,498**	**423,463**	**455,129**	**964,090**	**11.33**

Themes: Human Health & Nutrition

Issue:

A needs assessment identified target audiences and educational priorities for eligible food stamp recipients in Nevada. The assessment determined there was a need to increase the consumption of low-fat, calcium-rich foods among children (particularly females), ages 11-14 years. Youth in this age group have lower intakes of calcium, among other nutrients. If calcium needs are not met during this critical development stage, the risk of osteoporosis increases in later life.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) established the Nevada Nutrition Network (NNN), a statewide coalition of public and private partners, to create, implement and evaluate a nutrition program that reflects the principles of social marketing for those eligible for food stamps. The NNN developed a school curriculum for science classes and home and career classes, along with media activities and an extensive evaluation plan with the goal of increasing calcium intake among 11- to14-year-old children.

The program was launched in 2000 and repeated in 2001, 2002 and 2003 with classroom instruction in two middle schools – one in Las Vegas and one in Sparks. Special events to reinforce curriculum concepts were held at both schools. Sampling of calcium-rich foods allowed students to become familiar with foods such as string cheese and yogurt. A mass media campaign, "Calcium, Its NOT Just Milk," was conducted in both markets in 2000 and 2001; a more limited campaign was held in 2003 and 2004. Media included posters, bookmarks, billboards, bus stop shelters and radio spots recorded by the students themselves in local stations. In 2004, in addition to focusing on increasing consumption of foods with calcium, physical activity was emphasized to a greater extent through a Frisbee golf activity for students participating in one school's after-school program.

Impact:

The campaign has reached more than 3,000 students over the past four years. Pre-and post-tests conducted with the middle school students suggest the program was successful in enhancing knowledge of food sources of calcium, the perceived importance of eating calcium-rich foods and relative calcium requirements.

In a study completed by more than 700 students, post-test results showed a significant knowledge gain in six out of seven questions. Answers to food frequency questions showed there was a trend toward more frequent selection of calcium rich foods after the intervention with a significant increase in the consumption of milk and

cheese. Seventy-five percent of the students agreed the food tasting events encouraged them to eat more calcium-rich foods. An equal number agreed that after learning about the importance of calcium in science class, they included more calcium-rich foods in their diets. Total direct contacts in the program in 2004 were 10,479 with 166,800 additional indirect contacts through paid commercial radio advertisements and public service announcements.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific

Themes: Human Health & Nutrition

Issue:

Because many chronic diseases are attributable to poor diet, physical inactivity and overweight, it is essential to children start good health practices as early as possible. Although there is little data specific to Nevada, the National Center for Health Statistics' publication, *Health, United States, 2003*, showed that in 1999-2000, the prevalence of overweight and obesity among American adults was 65 percent, 15 percent of children ages 6-11 and 16 percent of adolescents ages 12-19. Individuals from lower socio-economic status are more likely to be overweight or obese than those of higher socio-economic status.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) collaborated with ACF Chefs of Las Vegas and developed a nutrition education curriculum that promotes practices engendering lifelong, healthy lifestyles in children. Chefs for Kids teaches nutrition to children ages 6-8 in 12 Clark County "high needs" elementary schools. Topical newsletters and monthly wellness calendars written in both English and Spanish are sent home to families to expand instruction into the home.

Every week, educators teach second-grade students about the origin, use and need for food. Students also learn about healthy food combinations and choosing foods that provide the greatest benefit to their bodies. Additionally, the chefs donate 300 hours yearly preparing much-needed breakfasts for the students at each participating school, with food donated by local properties and purveyors. The program is partially supported by a social function that raises more than $90,000 yearly in private funds. The Chefs for Kids nutrition program was implemented at 21 schools and reached approximately 1,200 second-grade and 850 first-grade children in 2004.

The Chefs for Kids program has reached more than 15,000 students since its inception. To reach an even broader audience, UNCE collaborated with KLVX, the Las Vegas public television station, and developed "Adventures with Chefs for Kids," a series of five videos featuring puppets. The videos were transmitted to all Clark County first-grade classrooms through the instructional television system, augmenting a classroom curriculum developed by UNCE nutritionists. More than 2,100 copies of the curriculum were distributed in Nevada and other states. Teachers nationwide may access the lesson plans for this unique educational program at www.unce.unr.edu/publications/Chefs/Chefs4Kidsintro.doc

Impact:

In 2004, for second-grade students the first objective, hand washing, was evaluated after two food safety lessons were taught. A poster of a child washing her hands was hung in the restrooms of participating schools. Seventy-four percent of the students omitted no steps when tested on washing their hands. The second objective was measured following lessons on the food groups in the Food Guide Pyramid. In the pre-test, only 11% of students choose three snacks rated as "more healthful," while 52% of post-test students chose three snacks related as "more healthful." First-graders, many of whom were Spanish speaking only, were tested on recognition of the

Food Guide Pyramid. Sixty-two percent could name the Food Guide Pyramid when shown a picture of it. The food group name, recognition and categorization met with even better success. Eighty-six percent of students were able to name all five of the food groups, and 85% could name at least one food from each of the food groups correctly.

Source of funding:
Smith-Lever
State matching funds.

Scope of Impact:
State Specific

Themes: Human Health & Nutrition

Issue:
The prevalence of diabetes in the U.S. has increased from 1.5 million in 1958 to 18.2 million in 2002. Diabetes is also the leading cause of heart disease, disproportionately affecting diverse populations. Individuals of Hispanic origin are 1.5 times as likely, African American 1.6 times as likely and Native Americans twice as likely to develop diabetes as non-Hispanic whites of similar age. The growing numbers of diverse populations make reaching out to these groups imperative.

What Has Been Done:
University of Nevada Cooperative Extension (UNCE) developed "An Ounce of Prevention," a diabetes prevention program targeting Hispanics, African Americans and Native Americans who are at an increased risk for developing the disease. Lessons in both English and Spanish help clients learn how to reduce their risk by: making lifestyle modifications to prevent or delay the onset of diabetes and its complications; increasing physical activity; and adopting healthy eating habits.

Four separate, culturally sensitive curricula were developed and published: *An Ounce of Prevention African American; Native American; English Version for Hispanics;* and *Mas Vale Prevenir: Version en Espanol*. More than 1,000 Las Vegas residents have completed the program. An Ounce of Prevention was expanded through a train-the-trainer component; Native American health representatives and African American church volunteers have been taught how to educate others about diabetes.

Impact:
In 2004, of the 133 students attending the "Healthy Hearts" program workshops, 61 completed both the pre- and post-surveys. Knowledge of diabetes and risk factors were measured. A paired sample t-test demonstrated there was a statistically significant increase in participants' knowledge of risk factors from pre-test to post-test. For example, at pre-test, 60% of participants agreed they may be at high risk for diabetes; at post-test, 84% of participants reported having at least one of the four diabetes risk factors, and 56% had two or more risk factors. Scores on all five subscales are summed up to yield the overall score for dietary behaviors. On the overall scale and subscales, lower scores indicate better food choices. Paired sample t-tests were used to compare participants' pre-test and post-test scores. The results show a statistically significant improvement in scores from the pre-test to post-test on the food substitution scale.

By helping prevent diabetes in more than 1,000 clients, an estimated medical savings of more than $5 million was achieved.

Source of funding:
Smith-Lever
State matching funds.

Scope of Impact:

State Specific
Integrated Research and Extension

Themes: Human Health & Nutrition

Issue:

According to Healthy People 2010, income is associated with differences in the occurrences of illness, including heart disease, diabetes, obesity, elevated blood lead level and low birth weight. The mission of EFNEP (Expanded Food and Nutrition Education Program) is to assist families with limited financial resources by educational support and experiential learning to apply acquired knowledge, skills, attitudes and changed behavior to improve nutritional and health status in order to prevent chronic disease and enhance family well-being.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) engages adults and youth to improve nutrition through building basic skills. The key elements of education are food safety, wise use of food resources, buying, planning and preparing nutritious meals, encouraging physical activity, modifying behavior related to food practices and money management lessons. Program materials are available in English and Spanish.

EFNEP programming is conducted by paraprofessionals in small group classes at 17 agencies throughout Las Vegas. The small group classes are one hour in length and conducted each week for eight weeks. In 2004, more than 500 program families were enrolled, for a total of more than 2,700 family members reached through EFNEP programming. The youth phase, delivered during summer months, helps youth make healthful food and activity choices, and promote images about food and body size that are consistent with good health. The education is delivered through Boys and Girls Clubs, Scouts, recreation centers and after-school programs. EFNEP paraprofessionals trained nine volunteers who conducted summer nutrition education programming for more than 2,300 youth at several Las Vegas sites.

Program partners are Bridge Counseling Center, Cambridge Recreation Center, Cambridge Resource Center, CHOICES, Family to Family, Healthy Families, Healthy Families Resource Center, MASH Village, McCabe Family Resource Center, Parkdale Resource Center, Salvation Army, Shade Tree, Variety Day Home, East Valley Family Services Center and Headstart.

Impact:

EFNEP paraprofessionals conducted a pre/post evaluation of nearly 600 families (representing more than 2,700 family members), with a breakdown of 44% Hispanic, 37% Caucasian, 14% Black, 2% Indian and 3% Asian or Pacific Islander. Sixty-six percent of the families had incomes at or below the poverty level. Improvement in 72% was noted in at least one food resource management practice; 80% improved in at least one nutrition practice; and 63% improved in at least one food safety practice. A 24-hour recall analysis showed an overall group increase in consumption of servings of grains, fruits, vegetable, meat/alternatives and dairy. The results of a cost-benefit analysis indicate that for every dollar spent to implement this program, $10.64 is saved in future health care costs.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific

Themes: Human Health & Nutrition

Issue:

Data from The Centers for Disease Control and Prevention indicate that minority populations have a disproportionately high incidence of chronic diseases such as cancer, diabetes, heart disease, hypertension and stroke. According to the Centers for Disease Control and Prevention in 2001, the incidence of heart disease was 30% higher in African Americans than Caucasians; the incidence of stroke was 41% higher. Modifying the associated risk factors can reduce the incidence of these diseases.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed several programs to meet these needs. **Food for Health and Soul** seeks to decrease the risk of chronic disease by encouraging families to modify their favorite recipes, decreasing sugar, fat, salt and sodium and increasing fiber-rich ingredients during preparation. Twenty-five health coordinators were trained to teach this curriculum in the Las Vegas faith community. In 2004, 12 six-session workshops were delivered through nine churches.

The Healthy Hearts Project creates awareness of cardiovascular disease risk factors, providing educational programming to increase knowledge and build skills to bring about behavior changes to decrease these risks, as well as addressing barriers to seeking and practicing preventive medical care among African Americans. This collaboration between UNCE and the Community Partners for Better Health Coalition developed an action plan that creates awareness of "controllable" risk factors for cardiovascular disease and addresses cardiovascular disease disparity among African Americans. Healthy Hearts includes regular radio talk shows, newspaper articles, recipes distributed through churches, newsletters distributed to churches and healthcare facilities, and billboards and bus shelter posters. Workshops are held on the risk and prevention of diabetes and hypertension and increasing physical activity. More than 1,000 participants attended classes in 2004, with an additional 400 participating in exercise programs.

Impact:

Nearly 200 Food for Health and Soul participants completed pre- and post-tests. A paired-sample t-test showed significant changes in fat, fiber and sodium scales. Those results indicate participants have made changes in the direction of healthier behaviors related to fat, fiber and sodium intake after the workshops. Nearly all participants found workshop information to be excellent; 94% intend to use the information; and 98% will encourage others to attend the workshops.

African-Americans participating in the Healthy Hearts Physical Activity program have increased physical activity and exercise behaviors by 35%; more than 500 people have participated at 22 sites. Two surveys assessing general awareness were administered at two community health fairs. More than half correctly identified risk factors for cardiovascular disease; respondents correctly identified which diseases may be prevented through physical activity; and they correctly identified how to decrease fat and increase fiber in the diet.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific

<u>Themes: Human Health & Nutrition</u>

Issue (Who cares and why?)

You have just discovered that you are in need of an organ transplant, but the chances of finding a compatible donor are very small. Your doctor aspirates cells from your bone marrow, grows them in culture in the laboratory and then transplants them into the organ that is diseased. Miraculously, the cells from your bone marrow give rise to new healthy cells in your diseased organ, allowing it to regenerate and heal you. The groundwork for this apparent miracle has already been laid by researchers at the University of Nevada, Reno.

What has been done?

The UNR researchers' overall goal is to examine whether it is possible for stem cells from one adult tissue to adopt alternate fates upon transplantation in vivo, giving rise to cells within tissues other than their tissue of origin. They reasoned that the ideal way to examine this hidden potential was to transplant the cells into the fetus at a time when all the organs had begun to differentiate, but the need for exponential growth and differentiation could still permit the possibility of reprogramming of cellular fate through a bombardment of proliferative/differentiative stimuli without forcing the transplanted cells to adopt a specific fate by damaging/inducing regeneration within a particular organ. Thus far, the results have shown that it is possible to use adult stem cells from the bone marrow to produce human cells within the liver, brain, heart, and pancreas of recipient sheep, opening the door to the exciting possibility of treating a host of human diseases for which there are currently no cures.

Impact

Once the optimal cell type has been determined for generating each desired tissue, it will ultimately become possible to treat a wide range of human diseases including such candidates as myocardial infarction, hemophilia, and diabetes, using stem cells from the patient to generate the cells necessary to repair/replace the damaged/defective organ within the patient.

Primary Impact Area(s)

State Specific

Funding Source

National Institutes of Health, NASA
State Matching Funds

Themes: Human Health & Nutrition

Issue (Who cares and why?)

It's bad news, says your doctor. Your liver is failing. So he extracts stem cells from your bone marrow and injects them into a sheep fetus while it is still in the womb. When the sheep is born, much of the animal's liver will consist of your own cells - ready to be harvested and given back to you. This dream therapy is still years off, if it happens at all, but the first steps have already been taken by a team led at the University of Nevada, Reno.

What has been done?

UNR researchers original goal was to see if unborn children with genetic defects could be treated by injecting healthy stem cells into the fetus. This is still his main aim, but while doing animal experiments he realized the technique could also be used to grow "humanized" organs. Researchers first showed that when human stem cells extracted from bone marrow are injected into sheep fetuses, the human cells become part of the heart, skin, muscle, fat and other tissues. But the numbers of human cells were very low. In recent months, the team has now managed to produce sheep-human chimeras with a surprisingly high proportion of human cells in some organs. With recent results showing between 7 and 15 per cent of all the cells in the sheep's livers are human. In some special cases the human liver cells cluster together to form functional, fully human liver units, which could be transplanted whole as auxiliary organs.

Impact

If perfected, the technique could overcome some of the big stumbling blocks facing researchers who want to make tissues and organs for implants. It might yield significant quantities of just about any kind of cell or tissue, for instance, with no need to fiddle about with different culture conditions or growth factors. Instead, the host

animal's own developmental program guides the injected human stem cells into their final roles. "We take advantage of the growing nature of the fetus," Dr. Esmail Zanjani says.

It would also allow doctors to obtain immune-compatible cells without having to create human embryos by therapeutic cloning. Human cells could be separated from the animal ones simply by modifying existing cell-sorting machines. Providing the method really does produce normal human cells, they would not be rejected. And any stray animal cells would be killed off by the recipient's immune system.

Primary Impact Area(s)

State Specific

Funding Source

National Institutes of Health
State Matching Funds

Themes: Human Health & Nutrition

Issue (Who cares and why?)

You have just received the results of your prenatal screening and discovered that your unborn child has a life-threatening disease that will require lifelong therapy, but will not result in a cure, since the disease will cause a great deal of damage to the child during development, prior to birth. Your doctor gives a single injection of a genetically engineered virus containing a normal copy of the DNA that your child is lacking, and your child is born normally and lives a full healthy life, requiring no further treatments. This miracle treatment is known as fetal gene therapy, and a team at the University of Nevada, Reno has spent the last 12 years delineating the conditions that will one day make this dream a reality.

What has been done?

The UNR researcher's original goal was to determine whether it was possible to perform gene therapy in the fetus, early enough in development to permit delivery of the necessary genetic material prior to the onset of the irreparable tissue damage that takes place in many genetic diseases. A method was developed in which a single injection of a defective virus that had been engineered to carry a piece of "marker DNA" in place of its own viral DNA was given to young sheep fetuses, and researchers found that this approach resulted in lifelong presence of cells containing the marker DNA within the sheep. Even more exciting was the finding that this DNA was being expressed and made into protein that, in the case of a patient with a genetic disease, could result in correction of the disorder. This protein was expressed in numerous organs of the sheep, suggesting that this simple approach could one day be used to treat genetic diseases that affect essentially any tissue in the body.

Impact

Once optimized and tested in a model system that accurately mimics a specific human disease, this type of therapy is one of the only treatments that could promise to offer a precise and specific means of permanently curing a wide range of genetic diseases before birth, thereby allowing the birth of a healthy infant who would require no further treatments.

Primary Impact Area(s)

State Specific

Funding Source

National Institutes of Health
State Matching Funds

GOAL 4: GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT

Overview: Through the deliberate incorporation of diverse and often conflicting interests, the POW goals of the community-based decision-making for natural resources include:

- To catalyze decision-making processes that build communities and produce sustainable agreements
- To facilitate the development of innovative collaborations for the conservation and enhancement of natural resources
- To analyze and strategically confront barriers to implementation of community-based decision-making and collaborative utilization models for public lands

Given the nature of Nevada, water and wildfire related educational programs have been a primary focus of the University of Nevada Cooperative Extension Service (UNCE). In both of these areas, UNCE faculty have made a significant impact and received local and national recognition for their efforts.

In the "living with fire" educational program, UNCE faculty continue to have a significant impact on people's awareness and preparedness for wildfires. The program has grown and expanded each year, and many request are received for materials and assistance from other states as well as from the Federal level. This is an integrated research-extension effort, and has led to statewide cooperation and involvement of Federal, state and local organizations concerned with wildfire prevention and preparedness.

Water quality is a concern for both urban and rural communities in Nevada. Major UNCE efforts have been devoted to working with local groups and organizations to reduce non-point source pollution, and to clean up various waterways. Because of the Fallon cancer cluster, significant water research and education efforts have been undertaken in the Fallon area. Additionally, having education programs for rural public community water supply operators has been important.

NAES research has focused on predicting hazardous spills in local water supplies, evaluating livestock grazing for vegetation management, compatibility of wildlife and livestock on irrigated pastures, arsenic and mercury contamination from mining in Nevada watersheds, using NAES field labs to conserve municipal water supplies, and evaluating various range management systems for post wildland fire grazing.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**IV**	**210,250 6%**	**3,389,741 94%**		**3,599,991 35%**	**51**
University of Nevada Cooperative Extension	**IV**	**445,367**	**2,205,856**	**2,370,814**	**5,022,046**	**77.98**

Theme: Water Quality/Soil Erosion/Natural Resources Management

Issue:

Lake Tahoe has been losing its world-renowned clarity at the rate of over a foot a year for more than 30 years. The loss of water quality and clarity can be attributed almost entirely to human impacts. There is an urgent need to educate residents and visitors about the relationship between their daily activities and the loss of valued resources. Most polls say that people want to protect their environment, but don't know how.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) joined University of California Cooperative Extension to form The Lake Tahoe Environmental Education Coalition (LTEEC), a collaboration of 30 agencies, educational organizations and non-profits interested in improving the effectiveness of environmental education

throughout the Tahoe basin. To enhance needs assessment, a web survey was developed that received nearly 200 responses. It was discovered that LTEEC is addressing eight of the 10 most highly rated of the 55 proposals for educational projects. Activities in 2004 include the continuation of the quarterly newsletter reaching 600 working group members, and the continuation of the educational media campaign – The Lake Tahoe Report – 90-second news reports aired weekly on KOLO-TV and KOH radio, accompanied by companion articles in Tahoe newspapers. Nearly 8,000 newsletters regarding environmental programs were mailed to Tahoe residents. Among the events sponsored by LTEEC in 2004 was a Contractors Workshop, which drew 230 people, a third more than the previous year. A special curriculum was published for use in this workshop, *How to Install BMPs on Developed Property in the Lake Tahoe Basin.*

Impact:

The Lake Tahoe Report is seen by 40,000 people nightly, 10,000 of whom live in the Tahoe basin, with a $200,000 value if the spots had been purchased. Two focus groups were used to evaluate the effectiveness of the TV segments. At the first meeting, the average score on the pre-test was 33% and 76% on the post-test; at the second meeting, the pre-test average was 38% and the post-test 72%. The two groups rated the importance of the subject matter a 4.9 on a scale of 1-5, and they rated the educational effectiveness and the interest/entertainment value 4.4 each. Also during 2004, 2,303 BMP site evaluations were performed on private properties and 1671 BMP Certificates of Completion were awarded by the TRPA, an increase over 2003. During the Contractors Workshop, the average score on pre-tests was 71%, compared to the post-test of 83%. In 2004, the popular *Home Landscaping Guide for Lake Tahoe and Vicinity* won a first place (gold) award from the national Association of Natural Resource Extension Professionals.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

Multistate Integrated Research and Extension (CA, NV)

Theme: Integrated Pest Management/Pesticide Application

Issue:

Central Nevada forage growers, particularly those in the Diamond Valley, have suffered severe losses in their timothy hay crops from tiny mites. The few control agents now available for timothy hay are expensive and require a special use permit. University of Nevada Cooperative Extension (UNCE) identified a critical need to obtain registration for pesticides suitable for use on cool season grasses to control the mites. In 2003, the UNCE plant and soils specialist brought this need to the national IR-4 program.

What Has Been Done:

The UNCE plant and soils specialist met with the Nevada Hay and Forage Growers Association (NHFGA) to identify potential products for submission to the IR-4 research program that would control the damaging mites. The team identified three potential pest control agents for submission in 2003. IR-4 has funding to initiate research on only 15 new fungicides, insecticides and herbicides each year; however, the miticide Acramite put forward by Nevada was selected as one of these 15 top priorities out of 350 requests nationwide. Acramite is used to control plant-feeding mites. IR-4 researchers are developing residue and tolerance data for the miticide; two sites in Eureka County monitor the efficiency of Acramite. In 2004 Nevada field trials were started to evaluate 12 pesticides to help ensure farm sustainability.

Nevada partners include the NHFGA, Nevada Department of Agriculture and USDA.

Impact:

It will take three years for the testing of the miticide by IR-4 researchers; the chemical product would be available for use under the new label authorization after that time. In the meantime, Nevada organized a coalition of faculty from western states to identify additional needs and develop appropriate programs. The Arid Southwest IPM Network, comprised of Nevada, Arizona, California and New Mexico, was organized and received a regional IPM grant.

The new regional collaboration will culminate in an IPM information network. It will be used to identify regional IPM needs, develop pest management strategic plans and establish priorities for future funding. It will also include a web site that will serve as the primary information source related to IPM functions for this multi-state project.

In 2004, a part time Extension Entomologist was hired from the University of California, Davis, to work with the IR-4 and Nevada integrated pest management programs. Also in 2004, an insecticide important on Alfalfa, Diflubenzuron was awarded an "A" priority, a research supporting full registration will begin in 2005 by the EPA.

Source of funding:

Smith-Lever
State matching funds
IPM funds

Scope of Impact:

Multistate Integrated Research and Extension (CA, NV, AZ, NM)

Themes: Natural Resource Management/Land Use

Issue:

Throughout the West, the land at urban fringes is being rezoned from large agricultural enterprises to smaller, one to 40+ acre parcels that maintain some agricultural uses while attracting a more diverse ownership. More than half of Nevada's farms comprise less than 10 acres. Local and regional impacts on soil and water resources often increase as larger parcels are rezoned into small acreage parcels.

What Has Been Done:

Under the leadership of University of Nevada Cooperative Extension (UNCE), a team from eight Western states spent 18 months developing a curriculum – *Living on the Land: Stewardship for Small Acreages* -- for teaching small acreage owners how to attain their property goals while protecting soil, water, plant, animal and other natural resources. The manual contains lesson plans, hands-on activities and 15 visual presentations. The team trained nearly 80 Cooperative Extension and natural resource agency professionals from western states, who in turn implemented the program in their respective states.

In Nevada, the curriculum was used to educate landowners in the Carson Valley to help improve water quality in the Carson River -- on the Environmental Protection Agency's 303(d) Impaired Waters List because of its turbidity, temperature and phosphorus levels.

Local partners are the Nevada Department of Environmental Protection, Carson Valley Conservation District and Western Nevada Resource Conservation and Development.

Impact:

Since the successful training of Western participants, more than 1,000 copies of the *Living on the Land* curriculum have been distributed to 42 states and four foreign countries. The curriculum has been used for three years in the Boise area, two years in Clark County, WA, as well as by the Carson Valley Living on the Land (CVLOL) program. A CVLOL program evaluation showed participants improved their water quality knowledge based on pre- and post-test results. One hundred percent of those who attended three or more workshops installed best management practices (BMPs) on their properties. The WA program evaluation found that 113 BMPs were

installed by class participants. More than 90% of respondents agreed the LOL course provided the level of information desired. Close to 50% tested their well water and had their septic systems inspected, and nearly two-thirds tested their soils. Eighty-four percent of respondents shared part of what they learned with others.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

Multistate Integrated Research and Extension (NV, WA, ID)

Theme: Wildfire Science & Management

Issue:

Living with Fire (LWF) is a comprehensive, multi-agency project aimed at teaching homeowners how to live more safely in high wildfire-hazard environments. The collaboration is enhanced by the Sierra Front Wildfire Cooperators, a group of 12 Nevada and California firefighting agencies, who came together to help communities prepare for dangerous wildfires. The importance of wildfire education was identified in a 1997 needs assessment involving local fire officials. Between 1999 and 2001, fire consumed 3.2 million acres in Nevada. More acres burned in Nevada during the 1990s than in the previous 40 years combined.

What Has Been Done:

The collaborators focus on pre-fire activities that reduce the wildfire threat around homes, thus improving the survivability of those homes and occupants. In 2004, responding to a request from fire departments, educational materials were made available in VHS and DVD formats. Due to a high demand, the first production of tapes and DVDs was quickly exhausted. Two subsequent productions totaled nearly 1,300 copies. Nearly 500 DVDs and 400 tapes have been distributed throughout Nevada in libraries and video stores. They were checked out more than 50 times from Western Area libraries and four times from the Mt. Charleston library since Fall 2004. The popular *Living With Fire: A Guide for the Homeowner* tabloid continues to be distributed locally and throughout the West and nation. The spin-off, non-profit Nevada Fire Safe Council continues to assist the state's high fire-hazard communities in reducing their wildfire threat.

Impact:

More than 2 million copies of *Living with Fire* have been printed; 16 customized versions of the tabloid have been created. In a survey, the publication received an average rating of 4.7, with 5.0 as "outstanding."

To date, the Nevada Fire Safe Council has acquired $4 million in grant funds and established 24 chapters. In 2004, $1,250,000 was spent on fuels reduction projects.

Plots of cheatgrass planted in a fuel break a year before the 2004 Carson City Waterfall Fire demonstrated the effectiveness of a herbicide in eliminating the flammable material and allowing native perennials to survive and reclaim the area. Two weeks after the demonstration, the 2004 Waterfall fire roared through the area destroying homes in many subdivisions while the Wellington homes adjacent to the test site were spared. The fire "lay down" at the edge of the test plots demonstrating how powerful this tool can be against cheatgrass in wildfire-prone areas.

As a result of this and other high-profile projects, UNCE received a $222,300 grant in 2004 from Carson City to assist property owners affected by the Waterfall Fire, provide education and training and coordinate all volunteer efforts related to restoring the health of the land and watershed.

UNCE, Eureka County, NDF, BLM and Nevada Fire Safe Council organized a partnership and compiled data to be utilized for wildland fire risk assessment in Eureka County, hard hit by fire in 1999 and 2000. In 2004, the data was used to develop a risk assessment plan for the county. The data also helped develop safety zones and firebreaks in order to protect property, livestock and humans and reduce the negative impacts of wildfire.

LWF's program leader received the 2003 National Fire Plan Award for Excellence in Community Assistance from the U.S. Department of Interior and USDA Forest Service, the highest form of recognition for community wildfire threat-reduction programs.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific
Integrated Research and Extension

Themes: Drought Prevention & Mitigation/Water Conservation/Recycling

Issue:

The Las Vegas Valley is one of the fastest growing areas in the nation. The area is also one of the driest in the nation. Rising water costs and legislation are forcing people to manage water more efficiently, such as utilizing desert landscaping, and are encouraging managers of large landscape areas to use poorer quality water for irrigation. Many golf courses and other large turfgrass areas will be converted to reuse water (treated sewage effluent) in the next 10 years. However, using reuse water improperly has been shown to damage golf course foliage.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) addresses these challenges through extensive education and research efforts. A course in the management of reuse water in urban landscapes is offered to personnel who manage large turfgrass areas; materials cover health issues, regulations, cost/benefits and best management practices. Research projects complement the classes. Nine Las Vegas golf courses are involved in a UNCE and Nevada Agricultural Experiment Station research project to help them transition to using reuse water. A study of ET controllers on 25 residential landscapes will evaluate how much water can be saved with this technology. Now in its eighth year, the Desert Green Conference educates commercial clientele and others, including Master Gardeners, who have an interest in water-conservation issues. Further education is accomplished through publications, the mass media and email, targeting homeowners and professionals.

Impact:

Preliminary results of the golf course study in 2004 indicate that with proper irrigation management, Bermuda grass fairways and bent grass greens can be successfully grown with reuse water with minimal side effects. Several research projects evaluate the sensitivity of trees to the application of sewage effluent on large turf areas. The first phase of the foliar damage study investigated the impact of applying reuse water via sprinkler irrigation directly to the canopies of 20 ornamental trees; however, only six could be recommended for use in landscapes spray irrigated with reuse water. An extensive plant list is being developed for managers to select the best trees for exposure to effluent, along with a visual damage index rating system. The plant list will be expanded to include 20 shrub and groundcover species. Based on foliar damage ratings, managers will know which species may require changes in irrigation management and which to select as replacement species.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

Multistate Extension (CA, NV, AZ, UT)

Themes: Endangered Species/Natural Resouce Management

Issue:

The multiple use of rangeland resources requires balancing of the various uses on both public and private lands. This balancing between resources and economic interests has always been a source of conflict in Nevada, sometimes leading to violence and litigation. The sage grouse population, once estimated to be 2 million in the West, has dipped to 250,000 or less. When groups threatened to list the species as endangered, Nevada Governor Kenny Guinn instituted a Sage Grouse Initiative with the goal of maintaining or increasing the numbers to prevent negative economic, recreational and other land-use impacts. He brought various interest groups together to develop and implement a 20-year statewide conservation program to balance the need for sagebrush habitat, sage grouse populations and economic activities.

What Has Been Done:

The Governor's Sage Grouse Conservation Team asked UNCE to provide group facilitation and technical input for six local planning groups as they developed local sage grouse conservation plans. These local plans represent the needs and aspirations of area residents and were developed through a public participation process facilitated by a team of UNCE educators. In 2001, the facilitation team was trained; the team and other UNCE resource people participated in the Governor's kick-off conference attended by 150 people. The geographically assigned communities continued their meetings in 2002 and 2003. Draft conservation plans were produced in early 2004 that identified current habitat conditions, sage grouse risk factors and strategies to enhance their populations. Nevada's final sage grouse conservation plan, incorporating local plans, was completed in July 2004 and presented to the Governor (www.ndow.org).

Impact:

This is a unique partnership and has been a public-awareness opportunity for UNCE to utilize its ability to meet a critical community and statewide need and contribute to the resolution of a high-profile, public-policy issue. It could be a model for the West in dealing with natural resource issues. The process has brought varied interests together and built productive working relationships. The team volunteers donated more than 9,000 hours of their time, for a total value to the state of more than $245,000. The final document, "Greater Sage Grouse Conservation Plan for Nevada and Eastern California," indicates Nevada has an abundance of sage grouse habitat and healthy populations, but a broad spectrum of public land-use restrictions might be necessary in some areas to protect the bird. Said Governor Guinn, "Our citizens have shown that regional resource planning efforts can be effective. A whole myriad of projects have been proposed and funded, and state and federal agencies are working closely to put projects on the ground to support sage grouse populations in Nevada." The 2004 U.S. Fish and Wildlife Service preliminary ruling was that the sage grouse did not warrant listing under the Endangered Species Act. This indicates the citizens of Nevada have played a prominent and successful role in ensuring the future of the sage grouse. An evaluation of UNCE's facilitation efforts is underway and will be completed in 2005.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific

Theme: Land Use/Resource Management

Issue (Who cares and why?)

Communities in arid regions of the world are increasingly turning to water reclamation and reuse to stretch water supplies. Through water reuse, communities can keep water tables from dropping and water resources from shrinking.

With ever-increasing demands upon limited water resources, increasing costs for water treatment, and more stringent effluent disposal regulations, it makes sense to consider reusing treated wastewater for beneficial purposes. Also, as urban populations increase, the need for more creative solutions to stretch water supplies has led to new technologies and more possibilities for water reuse.

What has been done?

Starting in 1997, the Nevada Agricultural Experiment Station and the City of Reno started a pilot reuse project on 150 acres of NAES forage and perennial pastures. Over time, a non-looped, effluent reuse sprinkler system was pieced milled together with above ground flow line to irrigate 350 acres. In 2002, the installation of 13,750 liner feet of 30 inch ductile main line, 11,880 linear feet of 12 inch PVC irrigation pipe, 26,300 linear feet of 8 inch PVC irrigation pipe, 22,500 linear feet of 2 inch stock water pipe, 700 4 inch risers, 34 frost free hydrants were installed. And an addition 20.25 mile wheel line sprinkler assemblies to complement the existing 24 wheel line assemblies. Construction was completed in 2002, thus releasing the 1,100 acres property from reliance on the Truckee River for irrigation needs.

Impact

Nevada Agricultural Experiment Station's Main Station Research Laboratory, an 1,100 acre ranch located in the heart of Reno, Nevada is doing its part in the effort to conserve regional water supplies. Through the reuse of municipal and industrial wastewater, NAES has reduced local treatment facilities impact on the Truckee River.

In 2004, over 4.5 million gallons per day (spring through fall) of pristine Sierra-Nevada runoff remained in the Truckee River as the NAES ranch released its dependency on standard water rights to the river. By diverting effluent to the ranch, over 7.250 million pound of dissolved solids did not enter the river. That is equivalent to 376 large dump truck loads of waste not polluting Reno's water supply.

Primary Impact Area(s)

State Specific

Funding Source

State Matching Funds

<u>Theme: Water Quality/Soil Quality</u>

Issue (Who cares and why?)

Gold-mining pit lakes in Nevada, when filled, will contain more water than all of the reservoirs within the borders of this arid state. On a statewide basis, all of the existing reservoirs within the state (excluding Lake Mead) contain approximately 600,000 acre-feet. In contrast, pit lakes in the Humbolt River Basin alone will contain 1,500,000 acre-feet.

An important factor of pit lake water quality is the interaction of groundwater with the walls and surrounding rocks of the pit. In an open pit, oxidation reactions on the exposed walls release sulfate, acid, and metals into the lake. Additionally, when a pit is excavated below the regional water table, the aquifer in the rock is pumped out or dewatered. This typically sulfide-rich rock will then oxidize when exposed to air that is pulled into the dewatered porous rock, generating reaction products on the exposed surfaces. As the aquifer recovers following mining, those oxidation products will be flushed into the pit lake by groundwater flowing into the cone of depression. For every acre-foot of water that is replaced with air, sufficient oxygen is introduced to generate 514 mg/L of sulfuric acid.

Thus, from a water resource perspective, pit lakes are important to Nevada, and the quality of the water in them will determine their future use, as well as their effects on the aquifer, wildlife and ecosystems.

What has been done?

Approximately 5 years ago, the DuPont Chemical Corporation donated a Passivation technology to UNR. This patented technology was designed to prevent acid generation from pyrite ore by passivating (neutralize) the surfaces with potassium permanganate. A thin but strong manganese/iron/magnesium layer is formed on the pyrite's surfaces preventing further oxidation, the mechanism the drives production of sulfuric acid. University of Nevada's role has been to investigate the applications of this technology both in the laboratory and mine sites across the western US and determine the potential cost of conducting this form of remediation to the mining industry.

Impact

"University of Nevada's Permanganate Passivation treatment performed well, and it is cost effective compared to the other treatments", said a spokesperson for the EPA's Mine Waste Technology Program. The advantage of the Permanganate Passivation treatment is that, in theory, it will not degrade over time and a onetime application is all that is required. Compared against three competing technologies tested by the EPA, University of Nevada's cost to treat 750,000 tons of waste rock came in at $3,241,408. Its next closest competitor Metals Treatment Technology cost $4,034,750 to treat the same amount of waste rock, a difference of $793,342.

With an estimated 35 pit lakes expected to form in Nevada, containing from less than 100 acre-feet up to about 540,000 acre-feet of water, University of Nevada's Dr. Glenn Miller said, "The mines down there are going to have a substantial impact on the groundwater system in Nevada because of the amount of water they're pumping out of the pits in order to keep them dry. Over the next ten years we figure it will create a groundwater deficit in just the Humboldt River Basin equal to 20 years of the total flow of the Humboldt River at Winnemucca. And once the cost of mining and pumping the water exceeds the value of the ore, the companies will say, That's it, and stop the pumps. That means groundwater will flow into the pits and create lakes. And if left untreated, many, if not most will be so contaminated the water will be unfit for human consumption or agriculture."

Primary Impact Area(s)

State Specific

Funding Source

Placer Dome Inc.
State Matching Funds

<u>Theme: Hazardous Materials/Water Quality</u>

Issue (Who cares and why?)

Industry, labor, government, and environmentalists agree on one issue: that acid mine drainage is the number one environmental problem facing the mining industry. Acid mine drainage occurs when sulphide-bearing minerals in rock are exposed to air and water, changing the sulphide sulphur to sulphuric acid. This acid can dissolve heavy metals found in waste rock and tailings such as lead, zinc, copper, arsenic, selenium, mercury, and cadmium, into ground and surface water. Acid mine drainage and heavy metals pollution can poison ground and drinking water. It can also destroy aquatic life and habitat.

Sulfate-reducing systems have the potential to remediate acid drainage at abandoned mine sites by reversing the oxidation processes which are responsible for creation of the acidic water and the release of the metals. In this process, a carbon source is used to biologically reduce sulphuric acid to hydrogen sulfide, followed by precipitation of metals (and others) as metal sulfides. This process raises the pH of the water and effectively removes most metals, and also reduces sulfate concentrations.

What has been done?

For the completed project, University of Nevada scientists have developed a metals and sulfate reducing bioreactor for use as treatment systems for acid mine drainage, utilizing inexpensive alcohols (methanol, ethanol and ethylene glycol) as carbon sources that can be dripped into bioreactors. To date, investigators have demonstrated that each of these alcohols can serve as a carbon source for sulfate reduction and metal precipitation. This year, scientists installed a recirculation system that has proven to remove 99 percent of all metals found in the mine's waste water.

Impact

The University of Nevada alcohol driven bioreactor demonstrates one of the most cost-effective method of treating acid mine drainage, and has wide applicability to other sites. At a cost of about $2.00 per day to treat roughly 8000 gallons of water (the maximum flow from Leviathan Mine, CA), remediation efforts could effectively treat this facility for the next thousand years and still not have spent as much as some lime treated facilities — the previously least expensive method. The combination of passive treatment and low sludge generation render this process appropriate for a wide variety of acid mine drainage sites. Four new bioreactors were installed at Silver Equity Pit Lake to treat high levels of zinc. These bioreactors are proving highly successful for treatment of zinc contaminated fluids that may not have high acidity, reducing toxic zinc levels to below 0.1mg per liter.

Primary Impact Area(s)

State Specific

Funding Source

State Matching Funds

Atlantic Richfield Corporation (ARCO)

Theme: Integrated Pest Management

Issue (Who cares and why?)

Saltcedar has taken over many of Nevada's stream banks and lake margins, according to Tom Dudley, associate research professor in the Department of Natural Resources and Environmental Science at the University of Nevada.

With roots that can seek groundwater as deep as 100 feet underground and the ability to drink water too salty for other plants, saltcedar (a.k.a. tamarisk) leaves other southwestern plants unable to compete. It spreads rapidly and can survive almost anything, from being submerged in water for more than a year to being consumed by wildfire.

Originally brought to the U.S. as an ornamental plant and to stabilize soil, saltcedar is at least partially to blame for lack of adequate water flowing into a number of lakes in Nevada. Dudley says saltcedar has caused major economic damage to Nevada's agricultural producers. Mechanically and chemically removing the plant is costly. "Farmers in Nevada area can't economically justify the cost to control saltcedar, and they want to put the land back into production."

What has been done?

The newest enemy of the invasive saltcedar is a tiny leaf beetle called Diorhabda elongata. Researchers at the University of Nevada are finding that the beetle, from China, is successfully killing off the tree. The quarter-inch long beetle is a good biocontrol of saltcedar because both larvae and adults feed exclusively on the plant, and the adults produce two or more generations of offspring per year. They not only eat the green vegetation, but in doing so create holes in the leaves through which water escapes, causing branches to wither and die.

The beetle was first introduced to Nevada inside multiple enclosed areas across several ecosystems so that researchers could study the effects beetles had on saltcedar. The beetles were then introduced to the wild in

Pershing County, Nevada 2002. To date, scientists are following the beetle's movements and survivorship along with saltcedar's reactions to being defoliated.

Impact

According to Dr. Dudley, using the beetles has obvious advantages over bulldozing the saltcedar. It is less disruptive and can easily treat a large area. Except for the cost of the research, it is basically free, whereas mechanical clearing costs $1,000 to $5,000 per acre.

Dr. Dale Devitt, a University of Nevada professor of soil and water based in Las Vegas noted that if, through removal or defoliation of saltcedar, the trees' water consumption could be reduced by half, an extra 50,000 acre-feet of water per year could make its way to Lake Mead. That's enough water to supply 125,000 people.

Allen Brinkerhoff a local grower in Pershing County, NV, said he is thrilled by the results the beetles have had on the saltcedar on his land. "They have done a good job. The effect is amazing." Two years ago the beetles defoliated 25-30 acres of Brinkerhoff's land and they now have defoliated over 1,000 acres of land.

The beetle is the first approved by the USDA as biological control agent for saltcedar in the United States.

Primary Impact Area(s)

Multistate Research (CA)

Funding Source

Agricultural Research Service
CSREES - Nevada Arid Rangeland Initiative
State Matching Funds,

Theme: Biodiversity

Issue (Who cares and why?)

The general dogma about curlew behavior – a bird listed by USFW as "of concern species" with only an estimated 20,000 remaining worldwide – is an animal that will nest only in wet meadows with short-grass and no shrubs, e.g., prairies. These environmental factors help mitigate the physiological constraints of an extremely long fledgling period, exposing chicks to all sorts of dangers. When compared to Nevada's common shore birds, the curlew typically requires double the time to fledge (70 days). The USFW states that the major threat to curlews is degradation of their native grassland breeding habitat. However, resent observations have found hundreds of curlews living in Eastern Nevada, a sagebrush community, with little to no water. What has brought these birds to Nevada?

What has been done?

Over the past 3 years University of Nevada researchers in cooperation with local ranches of the Humboldt and Ruby valleys have developed a grazing strategy that reduces risk of survival in Nevada's curlew populations. By following a few simple rules: grazing cattle in low-land valley pastures during the fall/winter months, moving the cattle off the pastures for spring/early summer months, using annual snow melt runoff to irrigate pastures and waiting until mid-July to cut a single hay crop, research data shows curlew populations are above average. To gain a better perspective of how these management practices might help curlew populations, University of Nevada scientists conducted annual censuses that determined not only total numbers and nesting success, but how many birds decided to return to Nevada as opposed to some other traditional spring breeding ground.

Impact

Over the past few years, ranchers along the Humboldt and Ruby valleys with guidance from UNR researchers have begun a management practice that has greatly enhanced Eastern Nevada's curlew population. A species of bird typically found in the teens can now be found by the hundreds. Site loyalty is proving to be nearly 100% by returning breeding pairs each year. By grazing cattle in the winter and moving them to higher pastures in the

spring/summer, flood irrigating with winter runoff, and not cutting the pastures for hay until July, curlew parents are now rearing 100+ chicks per year. These findings are generating heavy interest form USFW officials and environmentalists alike.

Primary Impact Area(s)

State Specific

Funding Source

Hatch
State Matching Funds

Theme: Natural Resource Management/Land Use

Issue (Who cares and why?)

Grazing has been around for thousands of years and rangelands have adapted to the impacts they faced over the years by animals, climate, and more recently humans. For quite some time however, different people look at rangeland conditions in different ways. On one hand, there are the environmentalists that want rangelands free from cattle grazing and restored to the way they were, with all native species and no exotic species. On the other hand, there are ranchers, along with some environmentalists, scientists, and some public who are willing to work together to improve poor conditioned rangeland and maintain well-managed rangelands. The way to improve poor conditioned rangelands is by experimenting with different management concepts while taking into account the past history of the rangeland.

What has been done?

In 1934 the Taylor Grazing Act established grazing controls on public land. At that time, the U.S. Forest Service—working with the University of Nevada's Agricultural Experiment Station and the Taylor Grazing Service—wanted to be able to measure the recovery rates from prior grazing practices. In order to compare grazed rangelands with rangelands that had been un-grazed, 28 exclosure sites—four-acre parcels enclosed by barbed wire to keep out livestock—were built at that time. Today, 16 of those sites remain intact and provided the basis for the study.

Impact

Livestock grazing advocates may have new ammunition in the dispute over the long terms effects of livestock grazing. The study, called "Vegetation change after 65 years of grazing and grazing exclusion," found that there are few differences among plant populations on grazed and un-grazed lands. What few differences exist between grazed and ungrazed rangelands are minor and "can even be somewhat beneficial," UNR's Dr. Barry Perryman said. One such benefit is that within the exclosures there is more vegetative ground cover, while outside there are more plants as well as greater variety of plants.

Primary Impact Area(s)

State Specific

Funding Source

CSREES - Nevada Arid Rangeland Initiative
State Matching Funds

Theme: Natural Resource Management/Land Use

Issue (Who cares and why?)

Large areas of Nevada rangelands are now dominated by cheatgrass *(Bromus tectorum),* an introduced annual. The negative impacts of cheatgrass are many. It has been shown to displace native perennial grasses on undisturbed sites. It is poor quality forage for most wildlife species and livestock. It grows prolifically in the normally sparse interspaces between native shrubs and grasses. This growth habit creates a continuous fuel load which dries rapidly in early summer. The result is a significant increase in the number of fires and a subsequent decrease in the fire return interval which eliminates many desirable perennial plants.

Rehabilitation of these rangelands requires a combination of cheatgrass control followed by reseeding with adapted plant species. Mechanical control of cheatgrass by mowing, disking, or burning has been shown to be relatively ineffective. The most successful controls currently in use involve spraying the cheatgrass with herbicides. While this method has shown good success, herbicide use is controversial and expensive.

What has been done?

A study was conducted on a cheatgrass dominated site within the Bureau of Land Management's Elko district, located in eastern Nevada. The different planting strategies (disk and drill vs. sheep grazing and trampling in the seeds) were compared using various seed mixtures in spring and fall plantings. Sheep grazed sites were grazed at least two seasons to control cheatgrass re-growth.

Impact

Sheep grazing of cheatgrass plots for 2 growing seasons following broadcast seeding of native grasses and shrubs was effective in controlling competition from cheatgrass, with the restored plant community being approximately, 90% native plants and 10% cheatgrass. When conventional disking and drilling of natives seeds was used, more native seeds germinated, but the plant community was approx. 90% cheatgrass and wild mustard.

Producers with sheep or goats are now being contracted to control weeds in 3 of the 5 Nevada BLM districts, with the Nevada Department of Wildlife, and on a number of private ranches by the end of 2004. Nevada's Natrual Resources Conservation Service (NRCS) has approved sheep and goat grazing as an appropriate weed control method for Environmental Quality Incentives Program funding.

Primary Impact Area(s)

Integrated Research and Extension

Funding Source

CSREES - Nevada Arid Rangeland Initiative
State Matching Funds

GOAL 5: ECONOMIC DEVELOPMENT AND QUALITY OF LIFE FOR PEOPLE AND COMMUNITIES

Overview: Our POW goals in rural economic development include conducting research and subsequent education for decision-makers on changing economic dynamics for their communities, developing leadership opportunities for community decision-makers, establishing and evaluating innovative decision-making models and extending research results in educational programs to stakeholders. In the area of youth and family development our POW goals include educating parents regarding quality childcare, conducting research and outreach on youth at risk, and conducting research and outreach learning on literacy.

UNCE's Project MAGIC (Making a Group and Individual Commitment) educational program was designed to teach at risk teens the skills necessary to become productive members of society. A decline in per capita incarceration was observed in those counties where MAGIC was implemented, and among youth participating. Project MAGIC has been expanded to new areas and from rural to urban counties, and to Reservations. Results of this program have shown a dramatic reduction in the % of youth returning to the juvenile justice system. Because of its success, the program has expanded into additional communities in Nevada.

Literacy programs have been important for the development of good parenting skills, as well as for helping youth. This has been especially important for families where English is a second language. After school and other programs where students can receive help with studies have also been important.

Nevada scientists have evaluated the financial impact of rangeland fires on Nevada cattle operations and skyrocketing utility bills. In addition, recreational valuations in Nevada have been determined to provide an economic impact of recreation on rural communities due to river volume changes resulting from mining gold. In addition we have had the benefit of increased security at our Valley Road Field Lab by providing boarding and staging areas to the Reno Police Department horses at our equestrian center.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**V**	**218,095 21%**	**802,125 79%**		**1,020,220 8%**	**15**
University of Nevada Cooperative Extension	**V**	**485,782**	**2,406,038**	**2,585,955**	**5,477,775**	**56.21**

Themes: Aging/Consumer Management

Issue:

More than 25% of the 85,000 new Clark County residents each year are seniors. With the majority of elderly residents relative newcomers, many lack the traditional support structures associated with work and family. The elderly have the potential to make great contributions to the community or to overwhelm state and local budgets with medical and social service costs. The National Institutes of Health estimate that delaying nursing home entry nationwide for just one month would save the country $3 billion annually. Equally important is the potential to facilitate successful aging and extend seniors' independent living status, a crucial potential quality-of-life benefit of the University of Nevada Cooperative Extension (UNCE) Seniors CAN program.

What Has Been Done:

Seniors CAN is a life skills educational program to improve older adults' quality of life and help them maintain their independence. Program objectives are to utilize the well-documented advantages of lifelong learning to enhance their sense of control over life, decrease loneliness and improve participants' self-esteem, which research demonstrates leads to improved health outcomes. Using the train-the-trainer teaching model, volunteer instructors – including graduate students, senior center directors, social service providers and older

adult peer educators -- were recruited and trained to expand the program. The program has received nationwide attention, with 10 states purchasing the curriculum for use in their states.

The curriculum includes 15 lessons on nutrition, personal safety, food safety, finance, general health and productivity. In 2004, expansion continued into the Spanish-speaking community and low-income housing sites, utilizing the Spanish-language curriculum. Seniors CAN was taught by UNCE staff and two volunteer instructors at nine sites in Clark County. Each student receives an average of 32 hours of instruction over a four-month period. In 2004, this involved 3,147 program student contact hours. The program has an extremely low drop out rate (less than 3%), and numerous additional participants who begin the program too late to be in-processed attend from one to 12 classes.

The seniors who completed the program are ethnically and economically diverse. The majority live on less than $20,000 a year, with 36 percent under $10,000. The mean age is 74. By the end of 2004, more than 420 participants had completed the four-month program, with hundreds of others attending from one to 10 classes.

Impact:

To date, nearly 15,000 Seniors CAN teaching contact hours has reached older adults in urban and rural Clark County. Comparisons between pre- and post-test scores for all participants who completed Seniors CAN show statistically significant improvements in knowledge, mastery or sense of control and a decrease in loneliness. Participants reported they apply program information into their everyday lives on a lesson-by-lesson basis, and wellness-related behavior changed as a result of their participation. Many report the education gave them "more control of their lives," a program goal directly related to the theoretical model connecting learning with self-efficacy.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific

Theme: Youth Development/4-H

Issue:

All children face risks as they grow and develop, and most children can benefit greatly from positive interactions with caring adults. Children who have strong interpersonal skills and support are less likely to participate in risky behaviors, such as drug and alcohol use, early sexual involvement and dropping out of school.

What Has Been Done:

For more than 90 years, University of Nevada Cooperative Extension (UNCE) has administered a 4-H program in Nevada, part of one of the largest youth organizations in the U.S. Many 4-H alumni have become elected state officials, legislators and teachers, contributing greatly to the state and their communities.

In 2003 and 2004, a team of UNCE specialists surveyed more than 3,000 4-H leaders and parents statewide They sought to measure the life skills that youth learn through their participation in Nevada's 4-H programs, using the 18 critical indicators of quality youth development programs determined by the National Academies Committee on Community Level Programs for Youth. They also wished to assess how well volunteers and parents are trained to work with youth to develop these skills. The purpose was to assess program strengths and weaknesses in order to target areas for improvement to ensure 4-H remains a viable youth development program that meets the changing needs of today's youth.

Impact:

In 2004, 4-H youth programs reached more than 66,000 youth, ages 6 to 18, in 4-H clubs, camps, after-school programs, community center projects, home study sessions and school enrichment programs. More than 3,300 adult and teen volunteer leaders helped in these educational efforts. The 4-H program in Nevada has been growing steadily; there was a 10% increase in 2004 over 2003.

From the 600 questionnaires returned from 4-H leaders and parents, the survey discovered that the most important skill a volunteer 4-H leader has that influences what is learned by youth is ensuring the physical and psychological safety of 4-H members. This includes managing conflict and keeping youth from bullying each other. Another leader skill is to challenge and engage 4-H youth through programs and activities, including encouraging youth to take on leadership roles. In 2004, follow-up workshops were conducted in Nevada counties, resulting in all counties agreeing to develop Action Plans to share the results with 4-H families. The majority of county 4-H staff are targeting conflict management skills as a high-priority program area to strengthen. Workshop attendees indicated the survey results would help them focus their program improvements more carefully and effectively.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific
Integrated Research and Extension

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

Issue:

Washoe County, Nevada, has a high transient population and some schools have a particularly high concentration of low-income and transient families. Children 6- to 12-years-old need supervision after school while parents are at work. Parents with low or poverty level wages often cannot afford childcare for their school-age children. All children face risks as they grow and develop, but children who live in low-income housing or are homeless may be at higher risk for participating in risky behaviors. These children can benefit from positive, nurturing interactions with caring adults. Children who have strong interpersonal skills and support are less likely to participate in risky behaviors, such as drug use, early sexual involvement and dropping out of school.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed the 4-H After School Club (ASC) to teach children basic life skills including math, reading, science, positive communication, goal setting, self-responsibility, decision-making and good nutrition. Youth who have these life skills are less likely to participate in risky behaviors. Additionally, the program helps youth complete their homework by providing quiet space, materials, support and encouragement. The program is based on research, child development theories and a respect for each youth's ability to make choices that are healthy and respectful of others.

The 4-H ASC is an educationally focused program for low-income and homeless youth. Grant funding was obtained to conduct the programs at 10 sites at high-risk elementary schools in Washoe County and Reno Housing Authority community rooms. The children receive a snack and help with their homework, and participate in other activities including reading and educational programs. Literacy skills are emphasized. Also offered are family centered activities such as family nights and a family newsletter, written in both English and Spanish. The youth participate in community activities, such as building flower and vegetable garden beds in the Master Gardener program, clean-up projects and canned food donations. Staffing opportunities have been expanded through university student work-study and internships, offering students real-life experiences before entering the workforce. In 2004, 120 youth were enrolled in the program.

Program partners include the Reno Housing Authority, Washoe County School District, 21st Century Community Learning Centers, Reno Department of Recreation, Food Bank of Northern Nevada and YMCA of the Sierra.

Impact:

Evaluation of the 4-H ASC has shown a significant increase in some children's reading grades and improvement of social skills for participants of all ages.

In 2004, the National 4-H Council selected two Latino brothers from Reno, Nevada as "WOW" success stories for their improved grades and behavior. They were featured on a national Web site and in J.C. Penney's *After School Times*, a newsletter distributed in their stores nationwide. Also in 2004, the Nevada 4-H ASC was one of seven nationally to pilot new alternatives and renewable energy projects. The youth participating had a 38% increase in knowledge in a pre-and-post-survey.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Leadership Training & Development

Issue:

University of Nevada Cooperative Extension (UNCE) has worked with the Washoe County Department of Community Development's Citizen Improvement Process for several years. The need for this program arose based on evaluation results of programs. In particular, there was a need for advanced training and skill building for the county's Community Action Board (CAB) members if they are to effectively participate in local government issues that impact their communities.

What Has Been Done:

UNCE developed and implemented an Engaged Leadership program to assist chairpersons and CAB members in their efforts to create and sustain effective boards. This program is a custom-designed, six-session training and support to provide members with relevant information, hands-on practice, homework assignments and personal coaching.

In 2003, the program material and approach was revised based on evaluations from participants in the pilot program. New participatory exercises were developed, including a mock CAB meeting with roles, issues and exercises for discussion. The key principles of leadership were incorporated, and CAB members were shown how to put the principles into action. They were taught how to facilitate meetings, manage conflict and set goals. This program, certified as part of a university professional development course, also included mentoring and coaching.

In 2004, Washoe County agreed to offer the training to all Washoe County Advisory Boards, Committees and Commissions, so that now the program is offered to 17 boards in Washoe County. The revised program begins in February, 2005. The program also expanded to include Carson City Advisory Boards, Committees and Commissions.

Impact:

Conducting a goodness-of-fit test on the pre- and post-evaluations indicate that at the completion of the Engaged Leadership program, participants significantly rated their ability had improved in facilitating meetings or being facilitative, and they rated significant improvement in being a community leader. Additionally, 80% of participants rated the program had a strong impact on their ability to be an effective member of their board. Also

in 2004, CAB effectiveness was rated for the first time in northern Nevada, with the following results. Out of 177 issues, the CAB took action on 157 of them, and of these, 137 were supported by other boards, with a total overall success rate of 87%.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific

Themes: Child Care/Conflict Resolution

Issue:

Given that many children spend a majority of their days in childcare, there is a need to provide developmental literacy and language-rich environments in childcare programs. The quality of childcare is directly impacted by the education and training of child caregivers. The recent Nevada Childcare Work Force Study found that only 16% of responding caregivers have two or more years of early childhood education. Nevada has a 45% turnover rate for child caregivers. Agencies that had provided training in the past are no longer offering workshops for caregivers. There is a need to improve the health, safety and overall well-being of Nevada children in child care.

What Has Been Done:

These initiatives were established by the Maternal and Child Health Bureau and the Nevada Department of Human Resources, Welfare Division: (1) Assure quality in childcare by training child caregivers, and conduct a comparison study between Nevada and national regulations and performance standards; (2) Facilitate linkages between childcare agencies in the state; (3) Improve access to health services for children in childcare, particularly health insurance; (4) Improve child caregivers' knowledge through self-study guides.

University of Nevada Cooperative Extension (UNCE) plays an integral role in increasing the availability of education for caregivers statewide, thus, increasing the quality of care received by thousands of Nevada children over a period of 17 years. Results of a recent focus group indicate that UNCE is still very much needed as a primary provider of caregiver training.

UNCE's free workshops and the Caring4Kids modules enable caregivers to quickly get the training they need. In 2004, the curriculum focused on child abuse recognition and reporting. More than 470 caregivers, each caring for an average of 33 children, for a total of more than 15,500 children, participated in 20 workshops across Nevada.

Caring4Kids is a series of training modules, including videos, self-study guides and tests that are free and available at 65 Nevada public libraries, Cooperative Extension offices and other locations. Modules on Cognitive Development and Food Safety in Childcare Settings are currently available and approved for three hours of childcare training; additional modules are in progress.

Impact:

Evaluation results indicate participants made significant gains in knowledge regarding recognition and reporting of suspicions of child maltreatment-related knowledge and skills as a result of participating in the workshops. Caregivers were asked to rate workshop helpfulness. On a scale of 1 (not helpful) to 5 (very helpful), 93% gave the program a rating of 4 or 5. When caregivers were asked to rate instructor's effectiveness, on a scale of 1 (very ineffective) to 5 (very effective, 93% of participants gave the instructors a rating of 4 or 5.

The Caring4Kids modules have been checked out in libraries more than 1,400 times. Most participants (93-99 percent) say they plan to continue, implement or increase the use of nearly all strategies provided in the modules.

Source of funding:

Hatch
Smith-Lever
State matching funds.

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Community Development/Tourism

Issue:

A diversified stable economic base has always been a challenge and a goal for Lincoln County. The region has historically been highly dependent on natural resource industries, and land use has been restricted because 98% of the county is public land, with very little available for private sector activities. The county was eager to explore tourism opportunities as a means to diversify and stabilize its economy.

What Has Been Done:

Lincoln County has more state parks than any other county in the state and their hot springs and Cathedral Gorge with its sandstone hills remain an untapped tourist destination. The county requested that University of Nevada Cooperative Extension (UNCE) and the University's Center for Economic Development assist in the development of a strategic tourism plan designed to reduce economic dependence on resource sectors such as agriculture and mining, characterized as boom-bust economies, make contributions to other business sectors in the county and enhance economic development. "Clean" tourism jobs, particularly farm-based or ranch-based tourism, can keep families on their farm or ranch, and maintain the county's natural environment and quality of life.

In 2003, Tourism Planning Committees were formed in Alamo, Caliente and Pioche. The UNCE team conducted three town meetings in each community to develop a tourism vision, identify assets and set tourism strategy priorities. Community socioeconomic profiles were developed and presented during committee workshops. After completion in June 2004, the final technical report was presented to community advisory committees, the county commission, public land agencies and the general public.

Impact:

While measurable impacts are still in the infant stages as action committees begin developing advanced planning and implementation strategies, the UNCE program provides the key baseline information and process to begin these stages. There is a clear understanding of the communities and county socioeconomic indicators, which is very useful in discerning how the community can use existing resources (businesses, people and capital) for developing advanced strategies. Communities and county officials are developing specific strategic plans using current tourism amenities. They are exploring funding opportunities for amenity improvements and additions, and they have applied for $15 million in Southern Nevada Public Lands Act funds for tourism development on public lands. Tourism-related businesses have begun to develop tourism service-friendly operations including product selection, customer service and tourism amenity brochure advertising. UNCE economists published *Lincoln County Comprehensive Tourism Master Plan*, a University Center Technical Bulletin, UNCE 2004/05-09, June 2004.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific

Theme: Workforce Preparation – Youth (entrepreneurial skills)

Issue:

Research indicates youth ages 10-12 are the ideal age for learning to recognize entrepreneurial opportunities, assess the risk involved and bring the goods to market, thereby profiting from the opportunities. Since Nevada has one of the nation's highest high school dropout rates, fewer youth plan to attend college than the national average, and many view the gaming industry as an always-available job market. Small business acumen is critical for the future of these youth and the state.

What Has Been Done:

University of Nevada Cooperative Extension's Mini-Society is an experiential learning process where youth, ages 10-12, recognize business opportunities, develop entrepreneurial enterprises to capitalize on these opportunities and learn the complicated world of self-employment. Mini-Society participants design and develop their own society, creating a name, flag and currency. They identify tasks for which they initially earn money and ultimately identify and establish their own businesses to provide goods and services to fellow citizens. The goals of Mini-Society are to: 1) Teach decision-making skills through entrepreneurship concepts; 2) Provide youth with opportunities to experience entrepreneurship; and 3) integrate entrepreneurship with other subjects such as math, science, critical thinking, problem solving and cooperative learning. In 2004, eight program cycles were conducted for nearly 300 youth.

Partners in this project are Sunrise Acres Elementary School, Goldfarb Elementary School, C.C. Ronnow-Edison Elementary School and Nellis AFB Youth Center school age program.

Impact:

Using a pre/post, self-report survey, participant results were analyzed using paired t tests. On the critical program objective of decision-making, more than 240 participants reported significant improvements. Eighty-five percent of students reported Mini-Society taught them how a business works. Seventy-three percent said it helped them in their school work, and 89% said it helped them work as part of a team. On a scale of one (strongly disagree) to 4 (strongly agree), teachers said their students have increased their knowledge of how businesses work (4.0), increased their decision-making skills (3.5), increased their ability to get along with others (3.3) increased positive attitudes toward school and learning (4.0), increased their ability to work in teams (3.7), and increased their leadership skills and abilities (3.9). More than 96% of participants and teachers rated the effectiveness of the instructor as very good or excellent.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific

Theme: Parenting

Issue:

Nevada has one of the highest rates of child abuse in the country – one report for every 40 children. Research shows that poverty, inadequate health care, single and teenage parents and substance abuse are all correlated with the problems of child abuse and neglect. It is the only intensive, long-term, ongoing parenting outreach program in southern Nevada.

What Has Been Done:

Partners in Parenting provides educational programming for first-time mothers, childcare providers and English- and Spanish-speaking parents of infants and toddlers. Multiple strategies are used to educate the public in reducing child abuse, increasing child literacy, educating childcare providers and providing a safe, healthy childhood environment for Nevada's children so they grow into responsible, productive citizens. PIP is the umbrella for **Nuevas Famillias**, **Children's Literacy** and **Childcare Provider Training**. The class curricula consist of: **Fun to Play** (young parents interact with their children); **West Educational Child Development** (child brain development); **RETHINK** (anger management training); **SIDS** (Sudden Infant Death awareness); and ***Little Lives*** newsletters (age-paced monthly newsletters).

In 2004, more than 8,100 PIP educational programming classes were taught to English- and Spanish-speaking participants. Spanish-speaking families more than doubled the participating English-speaking families. ***Little Lives*** age-paced newsletters for new parents, in both English and Spanish, were sent out monthly; a total of 113,000 were distributed statewide in 2003.

Impact:

Evaluations of all programs showed significant gains in subject knowledge, including basic parenting skills, increasing parent/child interaction, understanding more about child development and learning how to control anger.

In the **Fun to Play** component, parents learn ways to play and interact with their children to increase the amount of positive parent/child interactions. In a survey, parents increased their level of understanding before the workshops from a 2.7 rating (on a 5-point scale) to 4.7 after the workshops; they also demonstrated a 4.7 confidence in their ability to use the material from the workshops.

In the anger management for parents classes, pre- and post-evaluations of nearly 80 parents showed: 96% of participants understood what triggered their anger; 89% recognized the signs that they were getting angry; 93% learned how they typically handle their anger; and 97% learned constructive ways to manage their anger.

A quantitative, five-state study of the ***Little Lives*** newsletters indicated that parents report using the newsletter and changing their behavior as a result. A follow-up study, using Nevada's Central Registry for Child Abuse and Neglect, showed that none of the participants had substantiated child maltreatment reports, while a high percentage of participants were at elevated risk for maltreatment.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Child, Youth & Families At Risk

Issue:

Nevada has one of the highest per capita juvenile incarceration rates in the nation. State and county costs for incarceration of Nevada juveniles is on the increase. Currently, the average cost to incarcerate a juvenile is $84 a day with a seven-month average stay. A statewide survey of all adjudicated youth in state-run juvenile detention facilities found that few alternatives to detention exist.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed Project MAGIC (Making A Group and Individual Commitment), a collaborative prevention program to help juvenile offenders leave the criminal justice system and become productive members of society. The program, originally designed for rural, entry-level juvenile offenders and their families referred through probation, has expanded to urban and Indian Reservation populations. The after-school program is conducted three times a week over an eight-week period. The youth learn communication, self-concept, team building, problem solving and decision- making, self-responsibility, conflict resolution, aspiration building, goal setting and community leadership. The parent sessions include the same life skills.

The Las Vegas program targets entry-level juvenile offenders ages 12 to 18; they are court-ordered to participate. The targeted juveniles are either in the detention facility or on probation. Clark County processes more than 2,500 juveniles each month.

There are currently eight Nevada sites which conduct Project MAGIC programs. Partners include school administrators, juvenile court judges, probation department personnel and others concerned about the welfare of young people.

Impact:

The national award-winning Project MAGIC has graduated more than 3,000 juvenile offenders in rural counties who have not reentered the justice system, saving taxpayers an estimated $5.4 million in incarceration

costs. Probation staff estimates only 10 percent of MAGIC graduates are further involved in the juvenile justice system compared to 30 percent in Nevada. A follow-up study of 100 MAGIC graduates shows they increased their skills in decision-making, conflict resolution, goal setting and communication. Further research of graduates reveals most are using program strategies to stay out of trouble with the law. In 2004, the program team conducted a pre-post survey of more than 200 MAGIC participants, a mix of ethnicity, gender, rural-urban and Indian Reservation youth. Results indicate MAGIC graduates are significantly more likely to: report their grades were better than most students in their class; say it is wrong for someone their age to smoke cigarettes; believe that smoking marijuana presents a risk of harm; and participate in service to their community. This survey indicates a positive change in the use of alcohol, tobacco and other drug use as a result of the program. A 2004 pre-and post-test of parents and guardians reinforced their children's responses. Project MAGIC was recognized as one of just two programs placed on a Web site as a Program of Distinction by the Cooperative State Research, Education and Extension Service after a national peer-review process.

Source of funding:

Smith-Lever
State matching funds.

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Children, Youth & Families At Risk/Leadership Training & Development (Military Youth)

Issue:

Youth today are exposed to a variety of alarming risk behaviors – youth violence, teen pregnancy, school dropout and substance abuse. Research suggests that an effective approach is to provide programs and activities that encourage positive development in youth. Positive youth development is highly related to a decreased likelihood of involvement with all types of risk behaviors. As youth develop, they need positive settings that offer the opportunity to build these important internal resources. It is particularly essential that teens be aware of the potential impact of their decisions and learn effective decision-making skills.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed Project Thunder on the Nellis Air Force Base in southern Nevada to increase the decision-making and leadership skills of teens; demonstrate positive decision-making and leadership skills through completion of community service projects and leadership roles; and increase youths' ability to see a positive vision of their future goals and dreams.

This program brings together middle and high school youth representing diverse backgrounds, and provides training in personal leadership, decision-making and civic responsibility. Adventure-based activities are used to help youth see beyond traditional barriers of race, religion, culture and class, and see themselves as part of a wider community. Youth attend residential leadership conferences, participate in adventure-based activities, such as repelling and trust exercises, take part in seminars and commit to working together on community projects.

Partners are the Nellis Air Force Base Youth Center, The Ruby Foundation, Monoco Middle School, Junior Achievement of Southern Nevada and church youth groups.

Impact:

Using a post-reflective, self-report survey, nearly 80 participants were analyzed using paired t-tests. Selective significant results indicate participant improvement on decision-making, leadership, teamwork and helping others. Structured interviews with teens conducted by staff indicate that many feel they are making better decisions regarding friends they hang out with, taking responsibility for what they do, choosing not to smoke, paying more attention in school to get better grades, and deciding on priorities and following them. Comments from the youth include: "I have more confidence in myself"; "I know how to work as a team and compromise"; and "I have gained friends and responsibility." Using a self-reporting survey: Seventy-seven percent of students said they were helped to become a better leader; ninety-three percent reported they learned how to work together with other students; and 82% said they learned about themselves. More than 40 teens (66%) have participated in community service projects totaling more than 500 hours of service. Fifteen teens (25%) demonstrate their leadership skills by participating on adult-led community committees, student government and teen councils.

Source of funding:

Smith-Lever
State matching funds.
USDA Military Grant

Scope of Impact:

State Specific

Theme: Community Development

Issue (Who cares and why?)

It is estimated that 30-40% of the developing world (more than one billion people) does not have access to potable drinking water. In certain population segments of Africa and Asia, safe drinking water coverage can even be as low as five percent, and eighty percent of sickness and death among children is caused by unsafe water. One of the most common features of unsafe drinking water stems from contamination with human waste. The problem rings especially true in regions of the world where pit toilets exist in seasonal flood plains.

What has been done?

Over the Christmas break 2004, Dr. Mark Walker and students from multiple departments within the University of Nevada traveled to the town of Plantanilla, Panama, population 250. To generate airfare and building materials financing, students learned the nuances of soliciting donations from NGOs, local government agencies and area vendors, while conducting numerous fund raising events on campus.

Upon arrival, the group quickly set out building the first flood-proof composting latrine as a model on which local residence could pattern. Students, with the help of regional Peace Corp volunteers, began the task of training locals how to build the latrine and more importantly how to operate the system.

Impact

By the end of the visit, students with the help of local residences, constructed five compositing latrines and donated all building materials needed to continue constructing latrines for the remaining residences. Harmony Fanrnsworth, one of the University of Nevada students stated, “The system was so simplistic yet so valuable.” “It seems like, that by simply showing the locals how to protect their local water supply from raw sewage, they understand it will save lives.”

Source of funding:

State matching funds.

Scope of Impact:

Integrated Research and Extension

Theme: Leadership Training and Development

Issue (Who cares and why?)

There is a serious and well-publicized shortage of qualified teachers all across America, especially in the "hard" subject areas of math, science. And, with many teachers from the "Baby Boom"-generation planning to retire as soon as they can collect a pension, the shortage isn't likely to ease soon. One tactic increasingly used in the educational recruitment wars is to seek out science and technology professionals in leading-edge companies and bring them into the classroom. Though these recruits usually lack teaching credentials, the experience and skills many of them bring from the private sector can be invaluable.

What has been done?

With only one faculty member at the University of Nevada, Reno (UNR) that specialized in horses and an ever growing call for a degree program in Equine Science, an innovative approach was needed to answer stakeholders' requests. Local veterinarian and alumni Dr. Rebecca Frankeny, DVM was brought in to teach Equine Reproduction and Equine Diseases. Dr. Frankeny's unique contribution came in the establishment of a training program for CE credits. Dr. Mike Kirk, DVM also a local veterinarian, opened doors to Equine Health that otherwise would not have been available to UNR students. To provide a business perspective to the program, Dr. Richard Godbee, PhD., PAS. and vice president of Evergreen Equine Products was recruited to teach Equine Nutrition and give his unique perspective on research and development.

Impact

Counting how many student have passed through the Equine Program since its inception in 2002 are in the hundreds. But measuring the effects of first-hand knowledge on the students can be summed up by Emily Kretschmer a former student of Dr. Godbee. "Seeing Dr. Godbee's successes in the business world and following the lines of logic in his nutrition lectures, I now want to continue education beyond a bachelors degree."

An unseen impact of bring professional into the classroom was altruism. One of the reason Dr. Frankey decide to return to the classroom was "training new scientists is my way of repaying my debt to the scientific community that trained me."

Source of funding:

State matching funds.

Scope of Impact:

State Specific

STAKEHOLDER INPUT PROCESS

In 2000, UNCE established a statewide Advisory Committee that represents a diverse cross section of stakeholders from both rural and urban communities, including minorities. This Advisory Committee has met at least twice a year since 2001 and continues to review UNCE programs and provide suggestions on additional program opportunities. It provides broad guidance on UNCE programming and policies, serves as a sounding board for setting program priorities, and has helped obtain support for UNCE from key state and county elected officials.

In 2000, UNCE administration began a series of statewide "community stakeholder meetings." Within their first year of being hired, UNCE funded campus based faculty are expected to conduct a formal needs assessment in order to identify critical issues in their subject matter area. For Extension Educators, a very broad, community-based assessment is expected. For Area Specialists, a broad, issue-based assessment is expected. State Extension Specialists are charged with compiling local needs assessments and adding statewide data and impacts. Indeed, one of the criteria for annual performance evaluation is effective assessment of need. Following the initial needs assessment, faculty are required to continually assess need and periodically conduct a needs assessment in a similar manner as expected of newly hired faculty. Information on the "community stakeholder meetings" and other statewide needs assessments can be found at: http://www.unce.unr.edu/Gateway/gateway.htm

As a result of the above processes for stakeholder input, all of UNCE's major educational programs are based on one or more needs assessments. UNCE has also used this information in strategic planning for the future. The data collected by UNCE is also used as the basis for broad Nevada Agricultural Experiment Station research priorities. In addition, NAES has conducted "rural tours" into the state and met with county and municipal decision makers, agriculture producers, state and Federal agency personnel and local high schools to obtain input into our research program. A newly formed citizens advisory committee meets quarterly and provides insight into NAES and College of Agriculture, Biotechnology and Natural Resource programming. Finally, the NAES has created a web page at http://www.ag.unr.edu/naes/index3.htm to connect stakeholders with campus faculty and Nevada Dividends, an impact database that is useful for establishing accountability.

PEER AND PROGRAM REVIEW PROCESS

There have been no significant changes in the peer and program review processes used by UNCE or NAES since the FY05 & FY06 Plan of Work Update submitted last year. These same procedures will continue to be used.

EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES

As outlined in the previous POW, and continuing for FY05 and FY06, University of Nevada Cooperative Extension (UNCE) and the Nevada Agricultural Experiment Station (NAES) will work together to build multistate, multi-institutional and multidisciplinary activities, and joint research and extension activities which address critical issues of strategic importance as well as those identified by stakeholders. All activities/programs of UNCE and NAES match needs/issues identified in the stakeholder input processes. Additionally, these activities/programs also address needs common to under-served/under-represented populations of the state, as well as activities/programs specific to the needs of these audiences.

For almost a decade, Nevada Agricultural Experiment Station (NAES) and University of Cooperative Extension (UNCE) have complied with the intent of Congress to *integrate agricultural research, extension and education functions to better link research to technology transfer and information dissemination activities*. These efforts of both UNCE and NAES are continuing. NAES has used the program priorities established by and needs assessments conducted by UNCE faculty as an initial guide in allocating their research funds. Collaboration with community-based faculty and developing research components to Extension programs has been openly endorsed.

UNCE likewise has made specific efforts. Scholarship has long been recognized as an expectation of community-based faculty. All major programs are grounded in research theory and deliberate attempts are made to include campus-based faculty who hold joint UNCE and NAES appointments in their overall design. Programs are rigorously evaluated so as to contribute to the knowledge base of theory in practice. Not only are campus-based faculty expected to be involved in the evaluation design, but UNCE faculty are expected to take a scholarly approach to their work.

Integrated and multistate programs have generally realized the outcomes/impacts expected. The multi-state research program and Western Coordinating Committee projects are reviewed by RCIC (which is represented by both Extension and Research) for progress during the course of the project/program and at project termination. The reviews are documented and housed at the executive director's office in the western region. This process will continue to be used. Additionally, UNCE faculty and campus faculty on UNCE appointments are expected to demonstrate program results/impacts as part of their annual evaluations. Therefore, peers and administration both have an opportunity to review impacts/results of all UNCE programs.

Both UNCE and NAES have a long history of integrated and multistate programs/activities. In fact, many of the State Specialists with UNCE appointments also have NAES appointments so that their research is closely related to their educational programming. Additionally, many UNCE faculty are participants with NAES faculty on research projects. Integrated and multistate programming is increasingly the result of more proactive processes, and has helped to identify ways for cooperation even outside of specific programs. For example, UNCE has continued an arrangement with Utah State University Extension for their Dairy Specialists to provide dairy programming in Nevada.

MULTISTATE EXTENSION ACTIVITIES

See Appendix "A" for Multistate Extension Activities**.** This reported is generated from a database and formatted consistent with Form CSREES-REPT (2/00), Supplement to the Annual Report of Accomplishments and Results. The amount of Federal dollars related to Multistate Extension Activities has risen for a number of reasons: 1) more faculty on Federal dollars are involved in multistate activities; 2) faculty are spending a higher percent of time on multistate activities; 3) faculty are more accurately reporting their multistate activities; and 4) Federal dollars are being targeted to those faculty with multistate activities.

INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

See Appendix "B" for Integrated Extension Activities**.** This reported is generated from a database and formatted consistent with Form CSREES-REPT (2/00), Supplement to the Annual Report of Accomplishments and Results. The amount of Federal dollars related to Integrated Extension Activities has risen significantly for a number of reasons: 1) more faculty on Federal dollars are involved in integrated activities, 2) faculty are spending a higher percent of time on integrated activities, 2) faculty are more accurately reporting their integrated activities; and 3) Federal dollars are being targeted to those faculty with integrated activities.

See Appendix "C" for Integrated Activities of the Nevada Agricultural Experiment Station (Form CSREES-REPT (2/00), Supplement to the Annual Report of Accomplishments and Results).

Appendix A
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

Institution: University of Nevada, Reno
State: Nevada

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

As described in plan of work.

Title	2004	2005	2006	2007	2008
4-H After School National Leadership Team	$12,324.75	$12,694.49	$13,075.32	$13,467.58	$13,871.61
4-H USDA Military Program	$26,377.47	$27,168.79	$27,983.85	$28,823.37	$29,688.07
Adolescent Suicide Risk & Peer Related Violent Behaviors	$12,948.53	$13,336.99	$13,737.10	$14,149.21	$14,573.69
Beef Quality Assurance	$22,057.18	$22,718.90	$23,400.47	$24,102.48	$24,825.55
BMP Retrofit Executives Group	$12,331.71	$12,701.66	$13,082.71	$13,475.19	$13,879.45
Carson River Coalition (CRC) Education Working Group	$12,331.71	$12,701.66	$13,082.71	$13,475.19	$13,879.45
Carson River Coalition	$4,918.35	$5,065.90	$5,217.88	$5,374.42	$5,535.65
Cattlemen's Update	$22,057.18	$22,718.90	$23,400.47	$24,102.48	$24,825.55
Child Care: Comparison Study	$7,365.08	$7,586.03	$7,813.61	$8,048.02	$8,289.46
Commercial water conservation training program (Desert Green)	$13,875.89	$14,292.17	$14,720.94	$15,162.57	$15,617.45
Commercial Horticulture	$6,324.80	$6,514.54	$6,709.98	$6,911.28	$7,118.62
Community Business Matching Model	19323.91	$19,903.63	$20,500.74	$21,115.76	$21,749.23
Contractors Best Management Practices (BMP) Workshop	$12,331.71	$12,701.66	$13,082.71	$13,475.19	$13,879.45
Desert Bioscape	$13,875.89	$14,292.17	$14,720.94	$15,162.57	$15,617.45
Distance Education / Extension Coffee Shop	$22,057.18	$22,718.90	$23,400.47	$24,102.48	$24,825.55
Family Resource Management	$3,057.36	$3,149.08	$3,243.55	$3,340.86	$3,441.09
Home Horticulture	$5,507.94	$5,673.18	$5,843.38	$6,018.68	$6,199.24
Horticulture/Natural Resources Education	$3,057.36	$3,149.08	$3,243.55	$3,340.86	$3,441.09

Appendix A (Cont.) – Multistate Extension Activities

Title		2004	2005	2006	2007	2008
Integrated Pest Management		$2,597.42	$2,675.34	$2,755.60	$2,838.27	$2,923.42
Lake Tahoe Environmental Education Coalition (LTEEC)		$12,331.71	$12,701.66	$13,082.71	$13,475.19	$13,879.45
Lake Tahoe Report Media Campaign		$12,331.71	$12,701.66	$13,082.71	$13,475.19	$13,879.45
Laughlin and Bullhead City Regional Community Economic Development		$8,157.55	$8,402.28	$8,654.35	$8,913.98	$9,181.40
Livestock grazing for Vegetation Management		$26,535.00	$27,331.05	$28,150.98	$28,995.51	$29,865.38
Living on the Land: Stewardship for Small Acreages		$8,962.63	$9,231.51	$9,508.46	$9,793.71	$10,087.52
Local Collaborative Planning for Natural Resources Conservation		$3,726.96	$3,838.77	$3,953.93	$4,072.55	$4,194.73
Project MAGIC (Making a Group and Individual Commitment)		$60,252.72	$62,060.30	$63,922.11	$65,839.77	$67,814.96
Mass Media for Residential Community Audiences		$6,775.53	$6,978.80	$7,188.16	$7,403.80	$7,625.91
Master Gardeners of Southern Nevada		$6,775.53	$6,978.80	$7,188.16	$7,403.80	$7,625.91
Nevada Fire Safe Council		$19,942.98	$20,541.27	$21,157.51	$21,792.24	$22,446.01
Noxious Weed Control		$29,935.52	$30,833.59	$31,758.60	$32,711.36	$33,692.70
Pesticide Safety Education Program		$2,597.42	$2,675.34	$2,755.60	$2,838.27	$2,923.42
State and National Endeavors		$7,365.08	$7,586.03	$7,813.61	$8,048.02	$8,289.46
Sustainable Biodiversity/Multiple Use of Rangelands		$9,072.21	$9,344.38	$9,624.71	$9,913.45	$10,210.85
TAA Program for WA/AK Fisherman in Nevada		$4,753.30	$4,895.90	$5,042.78	$5,194.06	$5,349.88
Tahoe Basin Weed Coordinating Group		$15,298.80	$15,757.76	$16,230.49	$16,717.40	$17,218.92
Water Conservation in Urban Landscapes (Landscape Retrofit)		$6,775.53	$6,978.80	$7,188.16	$7,403.80	$7,625.91
Western Beef Resource Committee (Cow/Calf Handbook)		$7,563.90	$7,790.82	$8,024.54	$8,265.28	$8,513.24
Western Community Vitality Initiative		$19,323.91	$19,903.63	$20,500.74	$21,115.76	$21,749.23
Western Extension Farm Marketing Committee		$4,753.30	$4,895.90	$5,042.78	$5,194.06	$5,349.88
Western Nevada Flood Education Program		$12,331.71	$12,701.66	$13,082.71	$13,475.19	$13,879.45
Working with Teens National Youth Dev Study		$15,509.44	$15,974.72	$16,453.96	$16,947.58	$17,456.01
	TOTALS:	**$535,793.86**	**$551,867.70**	**$568,423.74**	**$585,476.43**	**$603,040.76**

Director **Date**

Appendix B
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

Institution: University of Nevada, Reno
State: Nevada

Check one:
_____ Multistate Extension Activities
_____ Integrated Activities (Hatch Act Funds)
___X__ Integrated Activities (Smith-Lever Act Funds)

Title	2004	2005	2006	2007	2008
4-H Youth Development Programs	$8,901.22	$9,168.26	$9,443.31	$9,726.61	$10,018.41
Adolescent Suicide Risk & Peer Related Violent Behaviors	$25,897.06	$26,673.97	$27,474.19	$28,298.42	$29,147.37
Alfalfa Seed Production	$41,934.94	$43,192.99	$44,488.78	$45,823.44	$47,198.14
Alternative Crop Production In Nevada	$74,467.40	$76,701.42	$79,002.47	$81,372.55	$83,813.73
An Ounce of Prevention: a program to help people reduce their risk of diabetes	$18,183.68	$18,729.19	$19,291.07	$19,869.80	$20,465.89
Bee Population Management	$41,934.94	$43,192.99	$44,488.78	$45,823.44	$47,198.14
Beef Quality Assurance	$26,970.81	$27,779.93	$28,613.33	$29,471.73	$30,355.88
BMP Retrofit Executives Group	$20,086.79	$20,689.39	$21,310.07	$21,949.37	$22,607.85
Capacity Building for Cooperative Weed Management Areas	$8,962.63	$9,231.51	$9,508.46	$9,793.71	$10,087.52
Carson River Coalition (CRC) Education Working Group	$20,086.79	$20,689.39	$21,310.07	$21,949.37	$22,607.85
Carson Valley water quality education	$20,086.79	$20,689.39	$21,310.07	$21,949.37	$22,607.85
Child Care Nevada	$13,505.26	$13,910.42	$14,327.73	$14,757.56	$15,200.29
Child Caregiver Training - Western Area	$13,505.26	$13,910.42	$14,327.73	$14,757.56	$15,200.29
Collaborative Resource Stewardship (formerly Resource Conflict Resolution)	$11,258.28	$11,596.03	$11,943.91	$12,302.23	$12,671.30
Commercial Horticulture	$4,486.86	$4,621.47	$4,760.11	$4,902.91	$5,050.00
Community-Business-Matching (CBM)	$13,672.27	$14,082.44	$14,504.91	$14,940.06	$15,388.26

Appendix B (Cont.) – Integrated Activities (Smith-Lever)

Title	2004	2005	2006	2007	2008
Community/Economic Development	$4,486.86	$4,621.47	$4,760.11	$4,902.91	$5,050.00
Contractors Best Management Practices (Tahoe) Workshop	$20,086.79	$20,689.39	$21,310.07	$21,949.37	$22,607.85
Control of Tall Whitetop Along a Riparian Corridor	$26,535.00	$27,331.05	$28,150.98	$28,995.51	$29,865.38
Cuentos en Familia	$48,920.33	$50,387.94	$51,899.58	$53,456.57	$55,060.27
Desert Bioscape	$13,875.89	$14,292.17	$14,720.94	$15,162.57	$15,617.45
Distance Education / Extension Coffee Shop	$26,970.81	$27,779.93	$28,613.33	$29,471.73	$30,355.88
Family Resource Management	$4,486.86	$4,621.47	$4,760.11	$4,902.91	$5,050.00
Family Storyteller for Infants and Toddlers	$34,190.17	$35,215.88	$36,272.36	$37,360.53	$38,481.35
Home Horticulture	$4,486.86	$4,621.47	$4,760.11	$4,902.91	$5,050.00
Improving Water Quality Through Wetlands and Irrigation Drainage Management, SBC, NV.	$8,962.63	$9,231.51	$9,508.46	$9,793.71	$10,087.52
Integrated Pest Management	$5,194.84	$5,350.69	$5,511.21	$5,676.55	$5,846.85
International Agricultural Cooperative Development Education Program	$7,951.64	$8,190.19	$8,435.90	$8,688.98	$8,949.65
Lake Tahoe Environmental Education Coalition (LTEEC)	$20,086.79	$20,689.39	$21,310.07	$21,949.37	$22,607.85
Lake Tahoe Report Media Campaign	$20,086.79	$20,689.39	$21,310.07	$21,949.37	$22,607.85
Living on the Land: Stewardship for Small Acreages	$8,962.63	$9,231.51	$9,508.46	$9,793.71	$10,087.52
Local Collaborative Planning for Natural Resources Conservation	$3,726.96	$3,838.77	$3,953.93	$4,072.55	$4,194.73
NEMO Nevada - Nonpoint Education for Municipal Officials	$8,962.63	$9,231.51	$9,508.46	$9,793.71	$10,087.52
Nevada 4-H: Continuous Quality Improvement and Action	$43,857.11	$45,172.82	$46,528.00	$47,923.84	$49,361.56
Nevada Range Monitoring Handbook	$16,720.20	$17,221.81	$17,738.46	$18,270.61	$18,818.73
North Lake Tahoe Demonstration Garden	$20,086.79	$20,689.39	$21,310.07	$21,949.37	$22,607.85
Parenting From Prison	$13,505.26	$13,910.42	$14,327.73	$14,757.56	$15,200.29
Parenting Issues at Ridge House	$13,505.26	$13,910.42	$14,327.73	$14,757.56	$15,200.29
Pesticide Safety Education Program	$5,194.84	$5,350.69	$5,511.21	$5,676.55	$5,846.85
Potential Revegetation Practices for Disturbed Arid Lands (mechanically disturbed lands)	$27,094.94	$27,907.79	$28,745.02	$29,607.37	$30,495.59
Potential Revegetation Practices for Disturbed Arid Lands (post-fire rehabilitation)	$27,094.94	$27,907.79	$28,745.02	$29,607.37	$30,495.59
Project MAGIC (Making a Group and Individual Commitment)	$43,857.11	$45,172.82	$46,528.00	$47,923.84	$49,361.56
Restoring Rangeland Health	$11,258.28	$11,596.03	$11,943.91	$12,302.23	$12,671.30

Appendix B (Cont.) – Integrated Activities (Smith-Lever)

Title		2004	2005	2006	2007	2008
Riparian Proper Functioning Condition Assessment		$11,258.28	$11,596.03	$11,943.91	$12,302.23	$12,671.30
Risk Management Education for Sustainable Agriculture in Nevada		$7,951.64	$8,190.19	$8,435.90	$8,688.98	$8,949.65
Sustainable Biodiversity/Multiple Use of Rangelands		$11,258.28	$11,596.03	$11,943.91	$12,302.23	$12,671.30
Tahoe Basin Weed Coordinating Group		$8,962.63	$9,231.51	$9,508.46	$9,793.71	$10,087.52
Truckee Meadows Weed Coordinating Group		$8,962.63	$9,231.51	$9,508.46	$9,793.71	$10,087.52
Wildfire fuels management/post fire rehabilitation		$21,413.77	$22,056.18	$22,717.87	$23,399.41	$24,101.39
	Totals	**$923,897.42**	**$951,614.37**	**$980,162.80**	**$1,009,567.66**	**$1,039,854.73**

Director **Date**

NEVADA AGRICULTURAL EXPERIMENT STATION
ATTACHMENT TO FORM CSREES-PLAN (2/04)
INTEGRATED ACTIVITES (HATCH ACT FUNDS)

TITLE OF PLANNED PROGRAM/ACTIVITY	Actual FY 2004	Estimated FY 2005	FY 2006	FY 2007	FY 2008
Freeze damage and protection of horticultural species	57,057	-	-	-	-
Freeze damage effects of drought on wine quality of various vitis vinifera grapes	4,929	60,711	52,159	13,402	-
Understanding and enhancing intergenerational literacy in ESL families	27,995	-	-	-	-
Adolescent suicide risk and peer related violent behaviors	29,768	11,250	-	-	-
Improving quality of child care in Nevada: Continued explorations	24,683	-	-	-	-
The Influence of Home and Child Care Environments on Toddler's Language and Literacy Skills	4,276	38,373	37,959	9,566	-
Statewide survey of elementary school employees	11,208	11,213	-	-	-
Strategic development of a competitive grape industry in Nevada	122,233	21,525	-	-	-
Rural communities and public lands in the West:Impacts and alternatives	35,001	21,780	23,030	26,780	20,085
Marketing and price risk management for coll season hay products in Nevada	1,235	23,350	18,900	5,100	-
Vegetation management along a riparian corridor	24,049	-	-	-	-
Nevada beef cattle: Marker assisted selection	99,998	51,119	7,875	-	-
Nevada beef cattle: The genetic basis of heterosis for adaptability in the Herford X Angus	3,876	42,582	49,427	12,357	-
Additional projects to be approved in years 2005-2008	-	-	8,923	131,068	178,188
TOTALS	446,308	281,903	198,273	198,273	198,273