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

Annual Report
of
Accomplishments & Results

Submitted March 4, 2003

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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 emphasize researching needs assessments, 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).

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, and improving the health of sheep for increased production success.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**I**	**238,182**	**1,827,643**		**2,065,825**	**28.3**
University of Nevada Cooperative Extension	**I**	**204,844**	**910,240**	**990,544**	**2,105,634**	**25.63**

Theme: ***Animal Production Efficiency***

Issue:

Nevada cattle producers have identified the reproductive management of beef cows as a high educational priority. Poor reproductive rates are one of the biggest issues facing the range livestock industry, particularly in dry years and with young cows. Non-producing cows drastically affect agriculture profitability. Failed return conceptions of beef cows are a common occurrence, particularly with young cows on the second and third conception. Research shows that reproduction, or simply weaning a marketable calf, is ten times more important than weaning weights and 20 times more important than carcass traits.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed and taught two interactive, compressed video programs on the Reproductive Management of Beef Cows at five sites with more than 100 cattle producers participating. In addition to tips on reproductive management, other subjects taught were: heat synchronization, artificial insemination and requirements of accurate and efficient heat detection. The programs were taught at two additional locations that had no downlink capabilities; all programs were taught in both English and Spanish. These topics were also taught to a group of Western Cooperative Extension specialists at a 2002 in-service training, and at the weeklong Cattleman's Update workshops, which reached a record attendance level of 400 people. Artificial insemination techniques were also taught at short courses at five statewide locations. Articles published in trade magazines and livestock newsletters reached a combined circulation of 30,000 Western beef producers. An additional 100 questions on reproductive management from Western ranchers were answered by phone, face-to-face or by email.

Impact:

A follow-up survey of the interactive video program participants reveals an 80 percent adoption rate of the reproductive management practices taught. About 80 percent of beef producers attending the artificial insemination classes went on to inseminate cattle the following spring. Educators in neighboring states have adopted much of the Nevada education in their programming, expanding the impacts throughout the Western range livestock industry. Furthermore, as a result of the videoconference programming, producers are becoming more accustomed to using this technology, which saves time and money for both participants and educators.

Source of Funding:

State Matching Funds

Scope of Impact:

State Specific

Theme: ***Animal Production Efficiency***

Issue:

Range livestock producers operate on a narrow profit margin so taking advantage of new technology is imperative to their financial success. However, finding specific production and marketing information in a timely manner is often difficult for ranchers residing in remote areas. Frequently when one producer has a question or problem, neighboring cattle producers have similar questions or issues. 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:

Nevada agriculture specialists have taken the traditional producer coffee-shop discussions into cyberspace. Extension Coffee Shop is a national subscribed email list designed to provide an instant two-way communication

network for livestock producers. The online system is a question-and-answer service that relays answers to one-on-one 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 service 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:

Extension Coffee Shop is a national award-winning program which reaches more than 250 Nevada, California, Oregon, Idaho and Utah producers. Its discussions have found their way into real coffee shops, feed stores and national trade magazines. Surveyed subscribers identify this program as their main source of reliable and unbiased livestock production and marketing information. All participants said that some aspects of discussions and information taught on Extension Coffee Shop have been implemented in their operation. Of the information implemented, producers say the new practices have either made life easier and more enjoyable, or improved the profitability of their ranch. One rancher saved $11,500 after using information on pricing protein supplements. After a discussion on postpartum supplement and its effect on second conception, some producers saved as mush as $10,000.

Source of Funding:

Smith-Lever funds
State Matching Funds

Scope of Impact:

Multistate Extension (CA, OR, NV, WA, ID, UT, MT and maybe more!)

Theme: *Risk Management*

Issue:

The beef cattle market is cyclic. Historically, cattle producers make money in the up years and lose money in the down years. Utilizing Chicago Mercantile Exchange's (CME) feeder and live cattle futures and options commodity contracts can minimize the impact of the fluctuating cash market. Nevada producers need a way to stay in business and avoid the pitfalls of down years. CME futures contracts can offset price fluctuations, but ranchers need help in understanding the market.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed Inside Beef, a year-long risk management program to teach futures and options techniques to ranchers. In the fall of 2001, 600-pound, pre-conditioned and weaned calves from Nevada, Idaho, California and Oregon were consigned to the program. Risk management in the form of futures and options was implemented and monthly marketing sessions began. Ranchers are given hands-on instruction in negotiating futures and options through the CME to avoid the ups and downs of industry prices. At each meeting one of the following subjects is taught: basics of futures and options; determining at-ranch breakeven cost of production; the USDA grading system; and factors that influence the market. After negotiating several trading exercises, ranchers consign some of their cattle to group ownership and compete.

Impact:

The Inside Beef and Risk Management educational program was selected the 2002 winner in the National Association of County Agriculture Agents Association's Search for Excellence in the Farm and Ranch

Management category, and regional winner and national finalist in the Livestock Production category. The program was selected based on its community impact. Due to the overwhelming success of the program, an $8,225 USDA Risk Management Agency grant was secured for the 2001 program. Inside Beef received national attention in the January 2002 issue of *Beef*, a national magazine with a 100,000 circulation.

Respondents to a 2001 questionnaire rated the overall program at 90 on a 1 to 100 scale. Eighty-five percent of producers who participated in all classes for a three-year period scored 100 percent on a post-test. To date, the program participants who have implemented risk management in the form of futures and options have increased their net income by an average of $20 per head. This equates to more than $30,000 combined for the 10 first- and second-year cattle producers who, as a result of the program, implemented risk management practices.

Source of Funding:

Smith-Lever funds
State Matching funds
USDA Risk Management grant

Scope of Impact:

Multistate Extension (CA, OR, NV, ID)

Theme: *Diversified/Alternate Agriculture*

Issue:

Alfalfa or grass hay production occurs on more than 90 percent of Nevada's irrigated agricultural lands. The lack of alternative crops limits producer alternatives when hay prices fall or input costs such as electricity rise. An increase in higher-value crops or crops that use less water enhances the contribution agriculture makes to the state's economy and opportunities for agriculture careers. These factors contribute to a need for alternative crop research and development for the sustainability of agriculture. University of Nevada Cooperative Extension (UNCE) is taking the lead in developing field trials, which determine the survival and production potential of alternate crops.

What Has Been Done:

The project generating the most interest is the testing of the survival and production potential of premium wine grapes (14 varieties) on two, three-acre vineyards in Churchill County. More than 200 people attended workshops, and the Churchill Grape Growers, Inc. association has been formed to support these efforts. Collaboration is also ongoing with growers in Lovelock and Yerington. Survival and production potential information will not be available until 2003.

At the Governor's request, a multi-agency group gathered to jump-start a commercial native seed industry in Nevada. There is a tremendous demand for the indigenous product for reseeding burned and depleted rangelands following wildfires. UNCE is producing a seed collection manual, and a plant materials center is being established. Two experimental plantings of native seeds were established in 2002; the five-acre seeding of Indian ricegrass failed due to lack of irrigation water; however, a Fallon seeding established two species. Production data will be available in 2003.

A successful hybrid poplar trial of 300 trees at the Newlands Research Center in Fallon is in its fourth year of production. The trees grew to heights of more than 20 feet.

The feasibility of establishing a malting barley industry in Nevada has been launched with a series of grower meetings; Anheuser-Busch Company helped establish preliminary plantings. More than 500 acres of malting barley has been produced.

A nursery stock trial was established on a Fallon farm to evaluate the feasibility of growing nursery stock as a new Nevada crop. Twenty-four species of trees and shrubs, consisting of nearly 750 bare-root plants, were planted in 2001, with plantings expanded in 2002. Field tours are planned for the spring of 2003.

New seaberry crop trials were established in Churchill and Nye Counties in 2002. This is a moderately sized shrub, widely grown in Europe and Asia, that is extremely hardy and tolerant to salty soils.

Impact:

The four-year poplar tree project has demonstrated that survival and production of hybrid poplars in Churchill County is adequate for a viable alternate crop; however, the pulp market for poplar trees has collapsed since the trees were planted. New markets for the trees are needed.

Most of northern Nevada is suitable for barley production. The yields in Pershing County were exceptionally high for all varieties.

The bare-root varieties of seaberry did not survive, but the containerized stock is alive and growing; production information will not be available until 2005.

Source of Funding:

Hatch Act funds
Smith-Lever funds
State Matching funds
Cooperators

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: *Diversified/Alternate Agriculture*

Title: Alternative Crops: Developing Wine Grape Varieties Adapted to Nevada's Climate

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. 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 they are a challenge to grow and maintain in Nevada's harsh climate.

What has been done?

In 1995, the University of Nevada, Reno (UNR) and Tahoe Ridge Vineyards and Winery teamed-up to establish a 1,080 vine experimental vineyard comprising 12 varieties of *Vitis vinifera* wine grapes in Reno, Nevada. These grape varieties were selected based upon their ability to produce quality wines in other regions that have similar climates to the Reno-Minden area (Bonn, Germany; Reims, France; Christchurch, New Zealand; Yakima, Washington). Some of these grape varieties have adapted better than others at the UNR vineyard.

Winter dieback has had a major impact on survival and productivity over the past seven years. College staff have replanted 15 to 20 % of the vineyard yearly. Of the 12 varieties, Muscat Blanc and Muller Thurgau were removed in the spring of 2001 and replaced them with Syrah and Merlot. The most promising varieties are Semillon, Chardonnay, White Riesling, and Lemberger, respectively. Some of these results were not expected based upon past performance of these varieties in other similar regions (Washington and Colorado). This points out that it is important to conduct variety trials in each region of interest, because they will perform differently (unpredictably) in different areas.

Irrigation can have an important impact on grapevines in semi-arid regions. In the summer of 2000, we applied water at 75% of the vines water usage. This resulted in a total of 9 applications for the entire season.

Impact

Variety trials suggests that it takes three years for new plants to start producing grapes. Economic predictions indicate that by the 4th year a vineyard produces enough grapes to become profitable. In the 6th year, establishment costs will be paid off (not including equipment and land costs). Thereafter, a grower averages a net return of $5,459 per acre per year at 2001 prices. A typical vineyard will last at least 20 years and may last 60 years if it is well maintained resulting in a net profit of $109,180 per acre over the typical life of a vineyard.

Our scientist have also shown that regulated drip systems reduce water usage in our vinards by 80% compared to previous year. This represents 0.27 acre feet of water per acre for the season (a very low level of water application). Churchill County, Nevada farmers produce quality alfalfa hay with an average application of 3.5 acre feet of water per acre per season (13 times more water than our application to grapes).

Another great finding is low level watering improved the overall vine quality. A 1999 White Riesling made from grapes at UNR by Tahoe Ridge Vineyard and Winery won a silver medal at the Nevada State Fair and recent wine tasting events was scored the 2000 harvest a 7.2 out of 10 on average.

This study along with previous work done by Tahoe Ridge Vineyard and Winery has led to the conclusion that wine grapes can be successfully grown in Northern Nevada and that it is possible to produce excellent quality wines in high semi-desert regions.

Source of Funding

Federal: USDA - Hatch Act
State: Nevada Agricultural Experiment Station
Other: American Vineyard Foundation

Scope of Impact

State Specific

Theme: *Animal Production Efficiency*

Title: Genetic And Dietary Factors To Enhance Beef Quality

Issue (Who cares and why?)

Meeting consumer expectations for product quality and consistency (particularly for healthiness) has been identified as a high priority by the U.S. beef industry. According to results of a recent consumer survey (1998), three primary factors that would motivate consumers to purchase more beef at retail markets are “lower retail beef prices,” “improved product quality and consistency at the same price,” and “improvements in the eating experience.” When asked about the use of certain genetic tools to enhance beef’s quality and consistency, most consumers indicated that they would buy beef that had been modified, if the treatment improved product quality.

The American diet tends to be deficient in conjugated linoleic acids (CLA), a type of fat that is vitally important for the health of the brain and nervous system and for numerous biochemical processes, including those that protect us against heart disease and cancer. Previous research has shown that grass-fed beef are much richer in CLA than the fat from animals that have spent many weeks in the feed lot. This notion has led to our investigations into special diets for beef cattle to raise the levels of CLA in their fat.

What has been done?

The main objective of this investigation was to determine the effects of beef cattle breed (Red Angus and Tarentaise) and finishing diet (high-grain or high-forage , with or without vitamin E supplements) on beef quality. Specifically investigators wanted to identify breed differences in beef quality under different dietary conditions and to identify dietary ingredients that increase concentrations of desirable fatty acids in general, and conjugated linoleic acid (CLA) in particular, in beef without affecting overall quality.

Thirty-two beef steers were used in a completely randomized design experiment. Four dietary treatments were evaluated. Steers from each breed were assigned at random to dietary. The steers were removed from feed but allowed access to water 12 to 24 hours pre-harvest. A multitude of measurements were taken to determine beef quality.

Impact

This project demonstrated that fish oil supplementation improved fatty acid composition of the loin strips(longissimus muscle). Specifically, investigators found on average 66% higher concentrations of the cancer fighting molecules "conjugated linoleic acid" - also known for reducing the risk of heart disease. These findings suggest that there's enough essential fatty acid in the lean tissue to meet 25-50% of the normal daily requirements for humans who consume this beef.

"We know we can increase the conjugated linoleic acid levels in beef," says lead investigator Hussein S. Hussein. "More importantly, this might help us improve the public's perception of beef if we can produce a generally leaner, more tender product that is high in conjugated linoleic acid. We're giving consumers a choice."

Tarentaise steers' feedlot performance and fatty acid composition of the loin strips were not affected by breed. Tarentaise steers had heavier carcasses, larger loin strip area, less back-fat thickness, lower marbling scores, and better yield grade than the Red Angus steers

Source of Funding

State: Nevada Agricultural Experiment Station

Scope of Impact

National

Theme: *Animal Production Efficiency*

Title: Improve Reproductive Efficiency Through Development Of Technologies And Systems To Control Estrous Activities, Conception And Fetal/Neonatal Survival In Cattle.

Issue (Who cares and why?)

Diseases of the reproductive organs in cattle usually develop so gradually that they go unrecognized until the disease is well established in the herd. Infected animals usually are not dying; in most cases, especially in males, they do not even appear ill. Some animals never show symptoms of the disease, yet remain a major threat to the rest of the herd because they carry disease organisms.

To prevent reproductive diseases, producers must always be on guard and practice good management techniques such as isolating newly acquired cattle and treating when needed. Currently, the only commercially available cures for cattle *Tritrichomonas foetus* (a reproductive diseases) are post diagnosis treatments. Our objective is to produce a prophylactic treatment (vaccine) for this disease.

What has been done?

The objective of this research was to continue investigating the antigenic and immunological basis of productivity increases resulting from a *Tritrichomonas foetus* vaccine. Specifically, we were interested in determining the extent of local immune response, the identity of protective antigens, and the feasibility of developing a DNA library of the organism. We found that there is substantial development of an antibody response in cervico/vaginal mucus following vaccination. Although total immunoglobulin concentrations did not elevate following vaccination, *Tritrichomonas foetus* specific antibodies increased significantly. These antibodies were found to react strongly with a conserved series of membrane glycoproteins which offer possible antigens for an improved *Tritrichomonas foetus* vaccine. Additionally, a DNA library of *Tritrichomonas foetus* mRNAs was produced in the "Lambda ZAP" cloning system. This library was be screened for *Tritrichomonas foetus* protein production and for its ability to initiate an immune response when utilized as a DNA immunogen.

Impact

The vaccine developed in University of Nevada, Reno's laboratories is currently the only prophylactic treatment for prevention of *Tritrichomonas foetus* reproductive disease. This vaccine protects from 30% to 60% of infected pregnant heifers from trichomonal abortion. Informal surveys have shown that Nevada ranchers are using the vaccine. If only 30% of infected heifers are protected, vaccination provide an economic benefit of approximately $950,000 per year to Nevada cattle ranchers.

Source of Funding

Federal: USDA - Hatch Act
State: Nevada Agricultural Experiment Station

Scope of Impact

Multistate Research (W-112) AK, AZ, CA-D, CO, HI, ID, KS, MN, MO, MT, NE, NM, NV, OH, OR, TX, WA, WY

Theme: *Animal Production Efficiency*

Title: Developing Techniques For Detection Of Subclinical "Invisible" Mastitis In Sheep

Issue (Who cares and why?)

No sheep producer needs to be reminded that mastitis causes heavy financial losses. Surveys show mastitis is the major reason for culling ewes (46%), well ahead of barrenness (37%). Added to this are the large number of ewes that die as a result of acute mastitis. And the damage doesn't stop there. The costs of antibiotics, the labor associated with treatments and fostering, reduced lamb growth rates and increased lamb mortality …the list goes on. To top it all off, treatment is rarely 100% successful, but early detection is the key to at least saving the ewe. The diagnosis of clinical mastitis is straightforward. Something is obviously wrong and it is easy to see. But with subclinical mastitis, the problem is detection.

What has been done?

This study was conducted using repeated sampling to access the incidence of subclinical mastitis (an invisible form of mastitis) in ewes over a lactation period. Somatic cell counts (SCC) of Rambouillet ewes were examined at 20 days postpartum. Ewes were then selected and categorized as having low or high SCC. Udder halves, rather than individual ewes, were reclassified as control or SM based on SCC values for each sampling period. Milk samples were collected at 30, 60 and 90 days + 1.6 day postpartum. Milk samples were collected at 0, 2, 4, and 6 hours and additional samples obtained at 12, 18, and 24 hours at 90 day postpartum. At 0 hours, a sample was collected, the udder was milked out and milk was allowed to accumulate over the sampling period. Samples were examined using differential fluorescent staining and flow cytometry to quantify the total SCC. These data suggest that it is difficult to identify all ewes with subclinical mastitis using repeated sampling measures over the lactation period because disease status varies.

Impact

What researches at the University of Nevada, Reno have found is that "flow cytometry" is proving to be the tool of choice for identifying ewes plagued with mastitis infections undetectable by visual inspections (a.k.a. subclinical). Flow cytometry is a means of measuring certain physical and chemical characteristics of cells or particles as they travel in suspension one by one past a sensing point. This new technique is allowing UNR scientist to count somatic/udder cells - udders consistently demonstrating low udder cell counts throughout lactation can be considered mastitis free, whereas high udder cell counts could be considered to have chronic subclinical mastitis.

Most would agree that an applicable and affordable management practice to reduce the amount of subclinical mastitis would be advantageous to the sheep producer. With the assistance of UNR, Nevada's sheep producers can test for subclinical mastitis for as little as $1.00 per ewe.

Source of Funding

Federal: USDA - Hatch
State: Nevada Agricultural Experiment Station

Scope of Impact

National

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 through vitamin supplementation.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**II**	**69,998**	**275,334**		**345,332**	**6.8**
University of Nevada Cooperative Extension	**II**	**-0-**	**17,591**	**-0-**	**17,591**	**0.15**

Theme: *Food Quality & Food Safety*

Issue:

The beef industry is a staple of Nevada's economy, and ranchers across the state are dependent upon consumer beef consumption for their livelihood. But the American consumer has become more wary of beef in recent years. They have demonstrated that the safety and quality of the food they eat is one of their top priorities. It is the responsibility of beef producers to ensure that every animal has been managed and treated correctly, and by doing so, producers are securing a bright future for the industry. Beef Quality Assurance (BQA) education has become a national initiative and top priority of the National Cattlemen's Beef Association. It is a necessary step to insure the industry's success.

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. During the first year of Nevada's BQA program, University of Nevada Cooperative Extension (UNCE) taught safety and quality assurance practices exceeding federal standards to more than 500 Nevada beef producers. Participants work closely with veterinarians, scientists and other specialists to keep cattle healthy, improving overall quality and consumer confidence. As a result, a grant was secured through the USDA Risk Management Agency and USDA Food Safety Inspection Service. With the help of UNCE specialists and Nevada Department of Agriculture personnel, a 44-page BQA reference book was published and distributed to all participants.

Impact:

Since 2000, more than 500 Nevada cattle producers have been taught methods that ensure the livestock in their operations have been managed and treated correctly; 250 of them have received certification. The program will directly affect the wholesomeness and safety of their beef products and the satisfaction of consumers. As the level of confidence in beef products rise, the demand is also expected to increase. An informal post survey conducted by the Nevada Cattlemen's Association shows that 90 percent of participants who became certified

have changed the way they process cattle. The BQA program in Nevada is part of a national effort, which has resulted in a 25 percent reduction nationally in the amount of injected site lesions due to improper vaccination protocol on beef cattle.

Source of Funding:
Smith-Lever funds
State Matching funds

Scope of Impact:
State Specific

Theme: *Animal Health*

Title: Development of Molecular Probes Designed to Diagnosis and Identify Foothill Abortion in Cattle

Issue (Who cares and why?)

Epizootic Bovine Abortion (EBA), commonly known as Foothill Abortion, is one of the major diseases responsible for reducing calf production on ranches in western and northern Nevada, California, southern Idaho and southern Oregon. Although infected pregnant cows do not show visible signs of illness, many of them abort their fetuses at six to nine months of gestation. A significant number of infected cows carry their calves to term, but the calves delivered are weak, fail to thrive and tend to die within the first weeks of independent life.

Although the organism which causes EBA has not been identified, it's been known for 40 years that the disease is carried by ticks (*Ornithodorus coriaceus*), and that cows get their infections from tick bites. Researchers at the University of Nevada have been studying ways to identify infected cows, and to understand the regional risks of ranches developing EBA in their herds.

What has been done?

For initial tick trapping studies, we identified a suitable 4,400 km2 area, incorporating vegetation types from the margins of California's central valley, across the full elevation gradient of the Sierra Nevada, and extending into the rangelands of the western Great Basin in Nevada. Preliminary data from these sites indicated that ticks were not indigenous to the lower sagebrush/rabbit brush areas of the Great Basin, but were present in higher elevations of the same areas which contained a mixture of sagebrush, pinion and juniper. Investigators also recovered numerous aborted fetuses, out of which 80% resulted from EBA. The fetuses have enlarged cervical lymph nodes, enlarged liver, fluids in the peritoneal cavity and small hemorrhages on the tongue, gums and around the eyes.

To begin to determine the numbers and maturity of ticks which carry the EBA agent, methods are being developed to determine whether individual ticks are infected with the EBA agent. Although the organism cannot be isolated and cultured in vitro, we have developed PCR primers which are specific for DNA sequences present only in infected bovine tissues. These PCR primers are being utilized to probe tick extracts for the presence of the cause of EBA. To date, efforts to develop DNA extraction techniques have depended on methodologies adapted from standard protocols. These methods have proven useful, but not universally successful, in extracting DNA suitable for PCR. Therefore, development of a suitable DNA extraction technique is currently ongoing.

Assuming that current techniques are at least 50% effective in extracting DNA suitable for PCR, our preliminary data indicate that, among groups of ticks trapped from the same site, approximately 2%-5% of ticks are infected with the organism which causes EBA. We have also determine if the organism is more likely to be found in male, female, or nymph ticks. The latest infectivity trials have revealed that 1st year heifers have an 80% chance of aborting their fetus, while cows removed from exposure for more than one year have a 40% chance of aborting. However, cattle once exposed to EBA within the last year are nearly 100% immune to

infection. This evidence indicates that cattle develop immunity with exposure to EBA, but must remain in contact to stay resistant.

Impact

It appears that EBA is now making its way into the drier regions of eastern California, south central Oregon and south western Idaho. EBA is a major source of economic loss for California cow/calf producers and estimates are that 5-10% of the California beef calf crop may be lost each year (45,000 to 90,000 calves per year).

Through a collaboration with University of California-Davis scientists have developed a new molecular probe from DNA extracts that allows researchers to determine if the organisms which causes EBA are present in fetal tissues of cattle and ticks. The probes were able to detect the EBA in over 90% of DNA samples which had previously been identified as EBA positive and did not detect the pathogen in any DNA sample extracted from tissues identified as EBA negative. Thus, this new diagnostic tool for EBA appears to have almost 100% specificity and over 90% sensitivity. Experiments to further characterize the agent of EBA led to discovery that the agent is sensitive to penicillin and streptomycin, alone, and in combination.

The bottom line, this new technique can be analyzed at around $40/sample and only requires four hours of a lab technician's time. The previous method cost well above $100/sample and required 3 days of prep work and a PhD to analyze the data.

Source of Funding

Federal: USDA - Hatch Act
State: Nevada Agricultural Experiment Station

Scope of Impact

Western Region

Theme: *Adding Value to New and Old Ag. Products*

Title: Vitamins For Cattle? Improving Beef Quality At The Retail Case

Issue (Who cares and why?)

Consumers judge beef by its color. Although beef loses its eye appeal long before it actually loses its wholesomeness, shoppers assume it's past its prime when the color is not bright red. Retailers must commonly discount such packages by up to 50% to salvage some value before the remainder is discarded. The National Cattlemen's Beef Association estimated losses range from $60 to $156 per 1,000 pounds of beef sold. In an attempt to capture a portion of this annual loss, researchers University of Nevada have explored the possibility of enhancing retail case-life through dietary supplementation of antioxidants such as vitamin E

What has been done?

The objective of our research was to develop desirable beef products with less than 30% of calories from fat for domestic markets and to extend shelf-life of beef for domestic and international markets. To achieve this goal scientist at University of Nevada began supplementing vitamin E to finishing ration at the rate of 500 I.U. for 100 days before slaughter.

The effects of supplementing at rates of 0 or 500 IU/animal/day of vitamin E for the last 100 days of the finishing period on retail beef case-life were observed using image analysis software. Obtainable case-life was prolonged ($P < 0.05$) by feeding supplemental vitamin E for ground beef (by 9 h), steaks from the clod (9 h), ribeye (14 h), strip loin (8 h) and inside round (17 h) and for roasts from the inside round (5 h). Packages discounted were decreased ($P < 0.05$) by feeding supplemental vitamin E for ground beef (7 percentage points), for steaks from the clod (7 percentage points), ribeye (2 percentage points), strip loin (3 percentage points), tenderloin (2 percentage points) and inside round (4 percentage points) and from roasts from the inside round

(14 percentage points). This study indicated that supplementing cattle with vitamin E improved case-life and decreased discount percentages of retail beef products.

Impact

In the current investigation, supplementation of cattle (i.e., 500 IU/animal/day for 100 days) with vitamin E extended the case-life of retail beef cuts under commercial conditions. Case-life enhancement was achieved in all sub-primal cuts with chuck and round cuts as well as ground beef showing the most benefit. Implementation of this technology costs the feeder approximately $4.00 per animal with an ultimate savings of between $30.00 and $35.00 per carcass marketed through retail operations.

Source of Funding

Federal: USDA - Hatch Act
State: Nevada Agricultural Experiment Station

Scope of Impact

National

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 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.

NAES research has focused on nutritional intervention strategies with dietary fat to assist in the treatment of human cancers and evaluated environmental tobacco smoke damage and protection through nutritional supplementation with anti-oxidants.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**III**	**103,903**	**478,313**		**582,216**	**14.3**
University of Nevada Cooperative Extension	**III**	**27,413**	**124,169**	**132,560**	**284,142**	**2.72**

Theme: *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. Modifying the associated risk factors can reduce the incidence of these diseases. A Clark County community health survey revealed that two-thirds of respondents feel the ability to shop for and prepare healthful foods has a positive impact on their health. Forty percent report having high blood pressure, 40 percent have a history of diabetes and 28 percent report high cholesterol.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed several Clark County programs to meet these needs. The first, Healthy Hearts, 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. It is a collaboration between UNCE and the Community Partners for Better Health Coalition to develop a community action plan that creates awareness within the community of "controllable" risk factors for cardiovascular disease and addresses cardiovascular disease disparity among African Americans. Healthy Hearts includes regular radio talk shows on KCEP, newspaper articles, recipes distributed through churches, newsletters distributed to churches and healthcare facilities, and posters out in the community. Workshops are offered in diabetes, hypertension and physical activity. A faith-based community aquatic exercise class is offered weekly at a municipal pool.

The second program, Food for Health and Soul, seeks to decrease the risk for chronic disease by encouraging families to modify their favorite recipes, decreasing sugar, fat, salt and sodium and increasing fiber-rich foods during preparation. UNCE collaborates with the Faith Community Outreach Projects to teach these principles. In 2002, the program offered 21 six-week workshops at 15 churches. Of the nearly 200 participants, 24 percent were male, 76 percent female, with 72 percent of participants between the ages of 46 and 75. Twenty-five health coordinators have been trained to teach this curriculum in the Las Vegas faith community. The classes include a presentation, lesson handouts and food preparation ideas.

Impact:

Surveys in the Healthy Heart program test the impact of the awareness activities. In 2002, more than 600 awareness surveys were collected at 14 locations within the two targeted zip codes, representing five different types of businesses and organizations. The survey revealed that churches were the best locations for program participation, followed by supermarkets. Ninety-four percent of respondents were African American; 50 percent had heard of the Healthy Heart program. Twenty-seven percent of respondents had heard the radio shows; 53 percent said the information was useful. Nearly 50 percent had heard of or read other health messages; 70 percent found the information useful. More than 100 surveys taken after a diabetes workshop showed a significant increase in respondents agreeing that losing weight decreases risk of diabetes. Changes in healthy behaviors were found in that a greater percentage of participants trimmed fat from their meat before cooking and frying fewer foods. Physical activity improved slightly.

More than 100 Food for Health and Soul participants completed surveys. Using a 5-point Likert scale, significant changes in the use of fat and fiber were found, as well as in sodium. Participants made changes in the direction of healthier behaviors related to fat, fiber and sodium. Workshop attendees reported making efforts to change their nutrition-related behaviors, and significant positive changes in actual eating habits were reported in the areas of fat, fiber and salt intake. This suggests that participants are looking for ways to improve these behaviors, and the workshops provided them with the knowledge to do so. Ninety-four percent of participants say they intend to use the information presented.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific

Theme: *Human Health & Nutrition*

Issue:

The prevalence of childhood obesity has dramatically increased nationwide. The underlying causes are many, ranging from genetic propensity to socioeconomic, cultural and environmental influences resulting in unhealthful eating and physical activity practices. A person's relationship with food and physical activity begins in infancy and is molded during childhood. It goes beyond food selection, preferences and quantity. It goes to the very core of adult-child interactions based on either trust (potentially supportive) or control (potentially damaging).

What Has Been Done:

Given the multi-dimensional causes of childhood obesity, educational programs are composed of a group of efforts under the Childhood Obesity Prevention in Nevada umbrella. No one program can achieve the overarching goal to reduce the incidence of childhood obesity; thus, the issue is addressed with a multi-pronged approach. University of Nevada Cooperative Extension (UNCE) efforts focus on adults who directly feed children (i.e., parents or childcare providers) or those who work with these adults (health professionals).

Little Lives is a series of age-paced newsletters sent monthly to new parents to guide them in their child's development. In 2002, more than 800 families received Little Lives Nurturing Partners Inserts that dealt specifically with food and feeding practices.

Enough is Enough is a program that demonstrates to low-income parents the appropriate portion sizes for young children through a visual teaching tool. More than 18,000 handouts were distributed. Another component is a children's storybook relating the concept of self-regulation of food intake to preschool children and their caregivers. Southern Nevada agencies distributed more than 18,000 handouts during classes and certifications; the Food Stamp office distributed nearly 4,000 handouts.

Nurturing Partners works in schools and homes. UNCE staff facilitate changes in knowledge, attitude and practices of teens regarding nutrition, health and parenting issues. The lessons include making healthful food and nutrition choices, maternal health care, infant care skills, child development, personal development, and financial and home management. Teens (ages 10 to 19) were selected because of the high birth rate in Nevada and Las Vegas. Initially designed as a home-visitation effort, the staff has begun to work with alternative high schools to bring core program elements to parents or prospective parents. This program augments child development, home economics and health classes. More than 2,000 students from eight schools participated in the program; two-thirds were female. Home visitations continue to support the most vulnerable pregnant teens in Las Vegas and East Clark County.

Impact:

Evaluation of the Little Lives Nurturing Partners Inserts shows increases in awareness, intent to use the information and understanding and knowledge. More than 95 percent of respondents feel the program is helpful in knowing an infant's hunger and fullness signals. When respondents were asked to demonstrate their knowledge by writing down signals of baby's hunger (besides crying) and fullness, 30 percent identified grabbing and watching for food, 37 percent chewing or sucking on hands, fists or shoulders, and 27 percent mouthing movements. Signs of fullness were noted as: baby turns away from food (27 percent), baby pushes food or bottle/breast out of mouth (16 percent); and baby lets food and liquids dribble from mouth (14 percent).

In the Nurturing Partners high school classes, students answering the surveys revealed a statistically significant improvement in nutrition knowledge; however, changing food behaviors is more difficult to achieve. Several reasons for this include a lack of access to food, reluctance to try new foods and resistance to authority suggestions. Following the program, however, nearly 20 pregnant teens delivered healthy infants, with a mean birth weight of 7 lbs. 6 oz.; most mothers attempted to nurse their babies.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific

Theme: ***Aging, Human Health and Nutrition***

Issue:

More than 25 percent 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 rather than warehousing them, 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 also has steadily expanded nationwide.

The curriculum includes 15 lessons, four on nutrition, four on personal safety, two on food safety, two finance related, two on general health, and one lesson on productivity. In 2002, the curriculum was translated into Spanish. Seniors CAN was taught by UNCE staff and volunteer instructors at nine sites in urban and rural Clark County. To meet the needs of the rapidly growing Hispanic population, a bi-lingual instructor taught the program in Spanish at a senior center.

The seniors who completed the program are ethnically and economically diverse. The majority live on less than $20,000 a year, with 34 percent under $10,000; 6 percent have incomes that exceed $50,000 annually. The mean age is 74. By the end of 2002, more than 200 participants had completed the four-month program, with nearly 300 others attending from one to 10 classes. In addition, 33 copies of the curriculum were sold to universities and senior service agencies in 16 states.

Impact:

Comparisons between pre- and post-test scores for all participants who completed Seniors CAN show statistically significant improvements in 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.

Scope of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific

Theme: *Human Health and Nutrition*

Issue:

Research has shown that if school-age children, particularly those with incomes at or below poverty level, get a healthy jump-start on good nutrition, their cognitive and physical development will be on course for life. And they will be at lower risk for developing chronic conditions such as heart disease, cancer and diabetes later in life

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) has teamed up with The Fraternity of Executive 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 through 8 years in nine Clark County "high needs" elementary schools. Every week, educators teach second-grade students about the origin, use and need for food. Students also learn about healthy food and choosing foods that provide the greatest benefit to their bodies. The chefs spend 300 hours yearly preparing much-needed breakfasts for the students with food donated by local restaurants and markets. The program is partially supported by a social function that raised nearly $100,000 in private funds in 2002.

To reach a 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 are available to all Clark County first-grade classrooms through instructional television, augmenting a classroom curriculum developed by UNCE nutritionists. More than 2,000 copies of the curriculum were distributed in Nevada and elsewhere. Teachers nationwide may access the lesson plans for this unique educational program at www.chefsforkids.org.

Impact:

Now in its 13th year, Chefs for Kids has reached more than 13,000 students, 1,350 second-graders in 2002 alone. The in-school program is evaluated by having students respond to questions by writing or drawing pictures addressing concepts covered in class. The snack assessment was administered through a pre-post paper-screening tool in 2002. Sixty-eight percent of students correctly defined variety as it is related to food as eating different types of foods. Students were able to list favorite foods according to their food groups with 86 percent accuracy. Students are motivated to choose fewer high-sugar/high-fat snacks. When comparing snack choices from before the intervention to those chosen after the intervention, 64 percent of students made healthier choices while 25 percent scored the same in their choices; only 11 percent worsened their choices.

Source of Funding:

Smith-Lever funds
State Matching funds
Other Private Donations

Scope of Impact:

State Specific

Theme: *Human Health and Nutrition*

Issue:

In 2000, more than 58,000 Nevada adults (4.4 percent of the population) were diagnosed with diabetes. An additional 600,000 people were at risk for diabetes because of age, obesity, sedentary lifestyle and ethnicity. The prevalence of diabetes in the U.S. increased from 1.5 million in 1958 to 17 million in 2002. Diabetes is also the leading cause of heart disease, disproportionately affecting diverse populations. Individuals of Hispanic origin are 1.9 times as likely, African Americans, twice as likely and Native Americans, 2.6 times as likely to develop diabetes as non-Hispanic whites of similar age.

The cost of diabetes in Nevada in 2000 was $665 million in medical care and loss of productivity. Individuals with diabetes spend $7,400 more annually on health care than those who do not have the disease. Preventing diabetes translates into huge medical savings to patients and the community.

UNCE identified a need for the development of a health communications message targeting the Spanish-speaking Hispanic population in one Las Vegas zip code in order to communicate risk reduction strategies to this vulnerable group. The campaign is based on the results of a telephone survey addressing diabetes awareness among those residing in the targeted zip code.

What Has Been Done:

University of Nevada (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. Nearly 1,000 Las Vegas residents have completed the program taught by three bilingual teachers. In addition, more than 30 health representatives from Native American communities and volunteers from African American churches were trained to deliver the program in their own communities.

A large media campaign involving radio announcements, bus stop shelter signs and the distribution of more than 1,200 pamphlets was launched in an effort to curb the prevalence of diabetes.

Impact:

Pre-post data is continuously collected and analyzed using a 49-item instrument. Extensive evaluation indicates significant behavior changes as a result of this program. Students improve food choices and increase physical activity. UNCE has documented that these behaviors are sustained over a period of six months to three

years. In 2002, 165 students from the Hispanic/Latino community completed the curriculum; 144 students completed the program through the "Healthy Hearts" program. At the conclusion of the program, students showed a significant improvement in knowledge of the connection between excess weight and diabetes. Statistically significant increases in lower fat food preparation and eating lower fat foods were also reported. Improvements were also shown in increased physical activity.
The National Diabetes Clearing House reported a 348 percent increase in the number of inquires from the target zip code area during the media campaign period as compared to the previous four months. At least some of this increase can be attributed to the campaign. The campaign is estimated to have made a total of more than 33 million impressions via radio spots and more than 1 million impressions through the bus shelter posters.

Source of Funding:
Smith-Lever funds
State Matching funds
Grant

Scope of Impact:
State Specific

Theme: *Human Nutrition*

Title: Nevada Food Stamp Nutrition Education Program

Issue (Who cares and why?)
As the cornerstone of the USDA's nutrition assistance programs, the Food Stamp Nutritional Education Program (FSNEP) plays a vital role in helping to improve nutrition in the nation, particularly among low-income individuals.
The "Community Partnerships: Nevada's Incentive Program" was designed to expand the reach of Nevada's part in the FSNEP through partnerships with other agencies and organizations that reach low-income audiences.
The goal of the program is to increase the variety and number of nutrition education programs that benefit food stamp recipients and other low-income audiences throughout Nevada. To accomplish this goal, the University of Nevada, Reno and the Nevada Division of Welfare are working together to help local agencies initiate or expand nutrition education programs in their communities and to provide the infrastructure necessary to receive additional federal funding.

What has been done?
To date we have developed a web site on Nevada's FSNEP that serves as means of sharing information about the program, local and federal guidelines, up-dates, existing FSNEP programs and resources. UNR representatives have met with representatives of the Nevada Welfare Division to ensure that the Plan is consistent with the needs of Nevada's Food Stamp Program clients along with consulting with support staff from other states to learn more about ways to expand the FSNEP within Nevada. Finally, information about the Incentive Program was sent to 600 potential collaborators throughout the state, the statewide conferences and the opportunities to expand nutrition education programs for Food Stamp Program clients.

Impact
During the first few years of the program, the University of Nevada took advantage of the incentive program and developed or expanded six programs that educated Nevadans in everything from nutritional curriculum in our elementary schools to showing senior citizen how to maintain a higher quality of independent living. In 2002, UNR has added two county school districts and the Pyramid Lake Paiute Tribe to the Nevada's Incentive Program as partners. Between the three group UNR help facilitate more than $50,000 in federal reimbursement for nutrition education activities in their communities.

Source of Funding

State: Nevada Agricultural Experiment Station, Nevada Cooperative Extension, Nevada Welfare Division

Scope of Impact

Integrated Research and Extension

Theme: *Human Nutrition, Human Health*

Title: Nutritional Intervention With Fat Containing Omega-3 Fatty Acids In The Treatment of Cancer

Issue (Who cares and why?)

Cancer accounted for over 500,000 deaths in 2000 making it the second leading cause of death in the US. Several studies and numerous observations have shown that incidence and mortality of cancer is lower in Eskimo populations of Alaska and Greenland and the general population of Japan. Why are these population different? Scientists at University of Nevada feel that the answer lies in their predominately fish diets.

What has been done?

Our laboratories have reported that diets rich in omega-3 fatty acids (fish and algae oil) significantly depressed the growth in athymic (nude) mice of human mammary carcinoma-MX-1, human colon carcinomas WiDr and Colo-205, human prostate carcinoma PC-3, human pancreatic carcinoma AsPc-1 and human ovarian carcinoma NJ8-97. In addition, we demonstrated that dietary fish oil improved the responsiveness of human mammary carcinoma MX-1 to chemotherapy with doxorubicin, mitomycin C and cyclophosphamide by enhancing drug activating enzymes within the tumors. The toxicity of cyclophosphamide was significantly depressed towards the host athymic (nude) mice by feeding fish oil compared to feeding corn oil.

We are currently following up on these exciting observations by investigating a variety of nutritional intervention strategies to improve the management and treatment of several types of cancer in laboratory animals with the ultimate goal to translate these animal findings into clinical trials. In addition, we continue to investigate the mechanism of growth inhibition induced by dietary fish oil. Preliminary findings from in-vitro and in-vivo studies indicate that the omega-3 fatty acids induce programmed cell death within the tumor. Our current work is focused on the biochemistry and molecular biology of tumor suppressor genes and proteins.

Impact

Encouraging results from nutritional intervention studies employing laboratory animals have shown that dietary algae and fish oil significantly depresses the growth of a variety of cancer tumors (mammary, colon, prostate, ovarian, and pancreatic) and inhibits metastasis (invasion of other organs/tissues). Human colon cancer growth in mice was depressed by 90% by feeding a diet rich in omega-3 fatty acids (8% corn oil + 16% golden algae oil) compared to a high fat diets (24% corn oil) . Similarly, colon cancer growth was depressed by 75% when mice were fed a high fish oil diet (8% corn oil + 16% fish oil) compared to 24% corn oil fed controls.

A terminal lung cancer victim learned of the privy to research being conducted at UNR and decided to take matters into his own hands, began taking fish oil supplements 31 months ago in hopes extending his life. His doctor reported that: “CT scans and X-ray analysis revealed a 66% decrease in size of lesions throughout both lungs. For a patient originally given only a few fleeting months to live, these finds are extremely encouraging.”

Source of Funding

Federal: USDA - Hatch Act

State: Nevada Agricultural Experiment Station, University of Nevada, Reno

Scope of Impact
National

Theme: *Human Health*

Title: Indoor Air Pollution In The Work Place: Can Vitamins Protect You From Secondhand Cigarette?

Issue (Who cares and why?)
Public exposure to environmental tobacco smoke (ETS) or side-stream cigarette smoke has become an issue of national concern. The potential health hazards from ETS are currently being investigated and publicly debated. A report citing 1985 population survey data identified Nevada as the state with the highest rate of smokers. A recent study by the Centers for Disease Control and Prevention cited Nevada as the state with the highest rate of tobacco related deaths in 1990.

ETS contains many compounds which are harmful through their production of toxic forms of oxygen. These oxygen forms can cause biological damage leading to various disease states, such as cancer or cardiovascular disease. We have previously shown in animals that short-term exposure to ETS causes biological damage by these same toxic oxygen forms. We are now interested in finding out whether or not vitamin supplements known for their antioxidant properties can protect/rectify damage caused by ETS.

What has been done?
This study analyzed blood samples obtained from non-smoking human volunteers who are exposed to ETS in the workplace and compare the oxidative stress in these samples to those obtained from workers in ETS free environments. We also tested whether antioxidant supplementation can moderate any increased oxidative stress due to workplace ETS exposure. These studies will be highly significant in that they will allow us to assess whether workplace exposure to ETS does result in increased oxidative stress and therefore greater health risks.

Impact
Environmental tobacco smoke (ETS) is an important indoor air pollutant that has been associated with increased risk of cancer and coronary heart disease. This is the first study to look at the effect of ETS exposure in the workplace and to provide evidence that antioxidant supplementation may be beneficial. Our research showed that employee exposed to ETS had a 63% increase in DNA damage over their non-exposed counterparts. Supplementation of antioxidant vitamins did prove to provide some measure of safeguard against ETS. Those who took the supplement saw a 62% decrease in DNA damage. With ETS accounting for approximately 12.5% of Nevada's smoking related deaths at a medical cost of $35,000,00 per year, implementing vitamin supplements program could save the state million.

Source of Funding
Federal: USDA - Hatch Act, National Institutes of Health

Scope of Impact
National

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 have had 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, pheromone protection of forests from bark beetle damage, compatibility of wildlife and livestock on irrigated pastures, evaluating a newly developed bioreactor to clean up the Leviathan Mine and 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**	**495,807**	**2,884,247**		**3,380,054**	**46.2**
University of Nevada Cooperative Extension	**IV**	**474,430**	**2,148,920**	**2,294,150**	**4,917,500**	**76.59**

Theme: *Water Quality& Riparian 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. Efforts at Lake Tahoe to achieve environmental education goals have been sporadic and disjointed. Outreach efforts have been under-funded, uncoordinated and only marginally effective.

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 24 agencies, educational organizations and non-profits interested in improving the effectiveness of environmental education throughout the Tahoe basin. Activities in 2002 include the continuation of the quarterly newsletter reaching 400 working group members; the development of an educational media campaign with KOLO-TV, accompanied by companion newspaper articles, which begins in early 2003; and the sponsoring of 47 community events, involving more than 5,500 participants. Just some of these are: Science Seminar on Climate and Watershed Modeling; Americorps volunteer training on environmental issues; Erosion Control and Best Management Practices Workshop for Contractors; Environmental Film Festival; Earth Day Festival; Water Quality Monitoring Team Leader training workshops; Snapshot Day citizen water quality monitoring; Lake Tahoe Research Symposium; and Science Seminar on Climate and Watershed Modeling. A regional coordinator was hired to fulfill the needs of LTEEC's K-12 watershed education working group.

The popular *Home Landscaping Guide for Lake Tahoe and Vicinity*, a 150-page, illustrated publication was updated with recent local regulations and an additional 10,000 copies were printed in 2002.

Impact:

Enhanced education was measured by pre- and post-tests at workshops, with an average 66 percent pre-test score followed by an average 82 percent post-test score. Also during 2002, 1,858 site evaluations were conducted by Partners in Conservation staff, and 659 Certificates of Completion were issued by the Tahoe Regional Planning Agency (TRPA). Snapshot Day citizen monitoring activities disclosed high turbidity in some stream locations; the TRPA has subsequently monitored these previously unmonitored sites. LTEEC was named one of only two natural resource programs in the country to garner a 2002 National Flagship Award from the Cooperative Extension System, presented at a national conference.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

Multistate Extension (CA, NV)

Theme: *Water Quality*

Issue:

The Fallon "cancer cluster" of 16 cases of childhood leukemia has caused concern about the safety of public and private water supplies in Churchill County, Nevada and other communities nationwide. Much of the area's water supply has been documented to contain arsenic levels in excess of that allowed by the Clean Water Act. Residents are asking for information on the long-term health effects of inorganic arsenic. In 2002, tungsten levels in the local drinking water supply and citizens blood were found to be abnormally high. Many citizens in the community think the cancer cluster is related to environmental causes, particularly the water supply. University of Nevada Cooperative Extension (UNCE) was asked by leaders to assist the community by conducting research and education programs related to water quality and human health.

What Has Been Done:

There are approximately 4,500 private wells that potentially provide drinking water for up to more than 10,000 of the 23,000+ residents of Churchill County. A recently completed sampling survey of private wells by UNCE and Nevada Experiment Station researchers indicates that concentrations of arsenic in groundwater supplies exceed federal drinking standards in 85 percent of wells sampled. In some cases, concentrations of arsenic are more than 100 times that allowed in public drinking water supplies. This study will continue through

2005 to: characterize the exposure to arsenic through private water supplies; examine the potential for fluctuations in the proportion and concentration of arsenic in the private, domestic, shallow wells; and disseminate information about water quality and treatment through the long-time UNCE Nevada Gold (Guarding our Local Drinking Water) program where trained volunteers help residents understand the significance of exposure and select appropriate treatment devices or alternative supplies.

In a second study begun in 2002, UNCE recruited more than 900, 20-year Churchill County residents 45 years or older to complete a 90-minute health analysis, including giving blood, urine, toenail and water samples. Conducted by the Environmental Protection Agency (EPA), it is designed to determine the potentially chronic health effects of long-term exposure to inorganic arsenic levels in the water supply.

Impact:

In the first study, arsenic concentrations in water from private wells was found to exceed the federal drinking water standards in the majority of samples collected. These results are consistent with samples taken previously by the U.S. Geological Survey. In the outreach component of this study, a water education specialist was hired and a "learning center" established in UNCE's Fallon office.

In the second study, the recruitment of 900 participants (in just a few weeks) was deemed a success. UNCE is part of the largest study of its kind in the U.S.; results are anticipated in summer 2003 when EPA scientists will hold a public meeting and individualized consulting sessions for participants.

Source of Funding:

Hatch Act funds
Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: *Water Quality*

Issue:

The increasing complexity of compliance with regulations related to drinking water supply system management is overwhelming for those who operate the smallest of Nevada's public water supply systems. Yet rural communities depend upon public water supplies that must conform to Federal requirements related to certification and plant operation. Most such public water supplies have limited resources, and are located far from training centers that offer assistance useful for passing certification examinations. Operators and managers also have difficulties meeting operating requirements, particularly those related to regular administrative functions and management. When out of compliance, these systems may be fined, which may raise the cost of water in rural communities.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed the Statewide Education for Water Treatment Plant Operators program to meet these needs. It delivers information about public water supply operation and management using videoconferencing facilities throughout Nevada. The target audience includes operators of the smallest water supply systems, usually serving fewer than 500 people. About 60 percent of the state's public water systems are in this category. Twenty workshops have been held since 2000, with 500 operators participating through 2002. Topics taught include water sampling techniques, jar testing, distribution basics, preparing consumer confidence reports, treatment facility basics, water system operator math, wellhead protection, contingency plan preparation, arsenic treatment and options, and capital improvements planning. Instructors include faculty from the University of Nevada and other public and private partners.

A special, four-hour distance education session is designed to help operators prepare for the certification examination. The class is held a day before the state certification examinations are administered. Water operators attend the review and take exams at five Nevada locations the following day. Information is presented on treatment techniques, distribution basics, policies, safety and management, and math for treatment and distribution operators. Instructors also provide confidence-building test-taking tips.

Impact:

A review of the certification examination-passing rate reveals that water operators who took the class prior to the exams had a passing success rate of 92 percent. This is notably higher than the average 84 percent success rate for the entire group that took the examination in 2002. Many of the class participants felt the review session had been a key factor in their success.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific

Theme: *Water Quality*

Issue:

The Las Vegas Valley is one of the fastest growing areas in the nation with 1,000 new residents moving in each week. The area is also one of the driest in the nation. More than 60 percent of potable water is used in the valley to irrigate urban landscapes. Rising water costs and legislation are forcing people to become more water-efficient (desert landscaping) and encourage the use of poorer-quality water for irrigation. The Southern Nevada Water Authority is campaigning to convert many golf courses and other large turfgrass areas to reuse water (treated sewage effluent) in the next 10 years. However, using reuse water requires very different management practices than potable water.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) addresses these challenges through extensive education and research efforts. Seven-week, hands-on landscape retrofit classes are taught to Las Vegas, Arizona, Logandale and Mesquite homeowners in how to create desert landscape designs that conserve water and energy. A course in the management of reuse water in urban agriculture is also offered to personnel who manage large turfgrass areas; materials cover health issues, regulations, cost/benefits and best management practices. Research projects complement the classes; partners include the Las Vegas Valley Water District and Las Vegas Valley Sanitation District. Nine Las Vegas golf courses are involved in a UNCE research project to help them transition to using reuse water. Now in its sixth 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 and the mass media, targeting both homeowners and professionals.

Impact:

The educational classes have demonstrated a significant increase in knowledge gained – i.e., an average 2-point gain on a 5-point scale. Thirty-six students in the landscape retrofit classes who completed residential landscapes in Clark County (totaling 4.2 acres) were documented by the Southern Nevada Water Authority to have an overall water savings of 39 percent, or 4.9 million gallons per year. The landscapers also saved more than $6,000. More than 350 commercial clients and 100 college students attended the 2002 Desert Green

Conference. A ten-month post-survey of the 2001 attendees revealed that 73 percent gained knowledge they are still using to better conserve and protect water; 23 percent are planting more drought-tolerant and/or native plants. During the past six years, more than 1,800 professionals have been educated in water conservation and protection, integrated pest management and the use of native and other water-efficient plants.

Source of Funding:
Smith-Lever funds
State Matching funds

Scope of Impact:
State Specific

Theme: ***Natural Resources Management***

Issue:

Throughout the West, population dynamics are changing. As communities grow, 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. The challenge is how to reach this audience and teach them the importance of land stewardship. Local and regional impacts on soil and water resources often increase as larger parcels are rezoned into small acreage parcels. This is due to increased densities of wells and septic systems, a rise in amounts of impervious surface, and the owners' lack of knowledge and experience with integrated pest management and forage and grazing management techniques. Changes in land management may also result in accelerated rates of soil erosion, increases in nutrient loads, pesticides and total dissolved solids in surface and groundwater supplies.

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 PowerPoint lessons targeting goal setting, property inventory, soils, water, plants and animals. In 2001, the team trained 50 Western professionals from Cooperative Extension units and natural-resource agencies. The training included a field trip to UNCE's successful Small Ranch program to talk with property owners who had implemented similar education in Reno. Subsequently, *Living on the Land* went national with presentations at several national meetings.

Impact:

Since the successful training of Western participants, during which 65 curriculum copies were distributed, more than 750 additional copies of the CD-ROM have been requested. In 2002, a follow-up evaluation of the curriculum was conducted; respondents represented 44 counties in 16 states, plus Australia; 35 percent of respondents were professionals. For most respondents, water-quality issues topped the list of program motivators, followed by nutrient management and water quantity. Respondents had used the materials to teach more than 1,100 people during the first year. The majority of respondents rated the manual's PowerPoint lessons most useful -- 91 percent ranked them 4 or 5 on a scale from 1 (not useful) to 5 (very useful). The program's students implemented hundreds of improved management practices. The curriculum also received two national awards of excellence. The training course will be offered again in 2003.

Source of Funding:
Smith-Lever funds
State Matching funds

Scope of Impact:
Multistate Extension (CA, NV, ID, UT, MT, WA)

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 the high wildfire-hazard environment of the eastern Sierra Nevada. 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 LWF outreach programs were identified in a 1997 needs assessment involving local fire officials. In 1999, fire consumed nearly two million acres of Nevada's rangelands; in 2000, an additional 600,000 acres went up in smoke. More acres burned in Nevada during the 1990s than in the previous 40 years combined.

What Has Been Done:

The collaborators focus on prefire activities that improve the survivability of people and homes. During 2002, University of Nevada Cooperative Extension (UNCE) worked with KOLO-TV in a series of news segments presenting wildfire safety messages aimed at increasing the public's understanding of Nevada's wildfire issue. KOH Radio also promoted the segments.

UNCE also presented wildfire threat-reduction workshops to nearly 200 homeowners, and conducted defensible-space training sessions to Nevada Division of Forestry seasonable employees who, in turn, completed nearly 300 house inspections. LWF curriculum materials and PowerPoint presentations were also distributed to fire agencies.

The popular *Living With Fire: A Guide for the Homeowner* tabloid continues to be distributed locally and throughout the West and nation.

The non-profit Nevada Fire Safe Council, established after the first Fire Forum with representatives from 23 private and governmental agencies, continues to assist the state's high fire-hazard communities in reducing the wildfire threat. The Fire Safe Highlands, in the Virginia City Highlands, has reduced fuels by more than 200,000 cubic feet, installed 15 underground water tanks for storage and achieved many other community action projects.

Impact:

The LWF TV news tips reached an average of 24,000 households per show throughout the summer of 2002. More than 1.6 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 being "outstanding." Nevada's fire program coordinator received the highest recognition given by the U.S. Department of Agriculture, the first time this award has ever been received by a UNCE faculty member.

The Nevada Fire Safe Council acquired more than $1.2 million in grant funds in 2002, and established 14 more chapters in seven Nevada counties.

U.S. Secretary of the Interior Gale Norton will show the TV segment on The Fire Safe Highlands during a keynote address at the 2003 National Fire Plan Conference in Louisiana, with reference to the project as a "model program for the nation." The local community action group also secured $95,000 in grant funding during 2002.

Source of Funding:
Smith-Lever funds
State Matching funds

Scope of Impact:
State Specific

Theme: *Wildlife 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. University of Nevada Cooperative Extension (UNCE) has long been recognized as an expert in the facilitation of local and regional disputes over the use of resources, particularly involving livestock and wildlife interactions. 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 Gov. Kenny Guinn instituted a Sage Grouse Initiative with the goal of maintaining or increasing the numbers to prevent economic, recreational and other land-use impacts. He brought various interest groups together to develop and implement a 20-year statewide conservation program, based on local needs and input, 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 natural resource conflict resolution facilitative intervention and technical input for six local planning groups that are developing local sage grouse management plans. These local plans represent the needs and aspirations of area residents and are being developed through a public participation process facilitated by a team of UNCE specialists. 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. A draft conservation plan was produced in the Bistate (Nevada/California) Planning Group that identifies current habitat conditions, sage grouse risk factors and strategies to enhance their populations. Other groups are making progress toward a conservation plan.

Impact:

This is a unique partnership and has been a public-awareness opportunity for UNCE to prove its ability to meet a critical community and statewide need and contribute to the resolution of a high-profile, public-policy issue. The process has brought varied interests together and built productive working relationships. A key member of the Governor's team, remarked, "Cooperative Extension facilitators and technical experts are making a valuable contribution in educating and helping volunteers stay engaged when the going might get tough." The development of a 20-year plan will conserve sage grouse and sagebrush ecosystems, resulting in social, economic and environmental impacts.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific

Theme: *Water Quality*

Title: Predicting Concentrations and Timing of Hazardous Spills in Local Water Supplies

Issue (Who cares and why?)

Over 75% of the water supplied by the Truckee Meadows Water Authority (TMWA) to its 78,000 customers comes from surface water sources and storage. Almost all of the surface water sources are linked to the Truckee River, which originates in the pristine Lake Tahoe area, flowing 100 miles through the mountains and metropolitan areas of Reno and Spark, Nevada. One of the concerns for safety management of drinking

water is the fate and behavior of contaminants that may be spilled or discharged into the Truckee River. In particular, the TMWA would like to be able to estimate when a contaminant would arrive at each of the treatment plants to prepare for either diverting the contaminated flow or treating it appropriately.

What has been done?

UNR scientists investigated the applicability of a spill model originally developed by UNR faculty in 1996. Subsequent to the development of that model, a large flood occurred on the Truckee River in 1997, and the US Geological Survey (USGS) gathered additional hydrologic and transport data.

A second model (OTIS, developed by the USGS) was calibrated with data collected during a dye study on the Truckee River in 1999. We were able to calibrate and apply the OTIS model for flows in the river at about 500 cfs at Farad, CA (typical summer low flow rates). We combined the calibrated reaches into one model and set up spreadsheets to enable the user to quickly plot the results of model runs for spills at different sites. Thus, the model can now be used to evaluate threshold low flows and time to critical concentration at the Reno/Sparks Water Treatment Plants from spills of conservative elements of concern.

Impact

The Truckee River is the primary source of freshwater for all of Reno/Sparks, Nevada and flow rates are typically seasonal (i.e., spring/fall = high flows, winter/summer = low flows). The dilemma for water managers is during low flow periods. If a spill occurs upstream, the call for closure of intake pipes occurs almost immediately. This type of quick response, though good for the consumer's safety, doesn't allow managers much time to build up reserves.

With the help of UNR's scientists, TMWA now has the predictive power to inform plant personnel when to expect the arrival of spills and how long they will persist. While also providing evidence that previous predictive methods were not flexible enough to adjust to changes in river morphology.

Source of Funding

State: Nevada Agricultural Experiment Station, Truckee Meadows Water Authority

Scope of Impact

State Specific

Theme: *Natural Resource Management*

Title: Livestock Grazing for Weed Management Strategies

Issue (Who cares and why?)

There are an estimated 25,000 exotic plant species that have been introduced into the U.S.; approximately 5,000 of these have become established in natural and managed ecosystems. Many of these introduced species are now serious pests in U.S. pastures and rangelands. Former Secretary of the Department of Interior, Bruce Babbitt, reported that the nation spends $5 billion each year in attempts to control invading weeds.

How should we deal with the problem of exotic weeds? Herbicides, and their associated public health and environmental risks, are not as appealing to many concerned citizens as they once were. Alternative weed management strategies are imperative.

What has been done?

A conference titled "Livestock Grazing for Vegetation Management" was hosted by the University of Nevada, Reno. The leading researchers/educators and producer practitioners presented the scientific basis for and the practical application of prescribed grazing to achieve ecological goals in the following subject matter areas: grazing to control vegetation in new tree plantations; grazing as a vegetation control method to control wildfires at the wildlands/urban interface; using goats for brush control; using sheep and goats to control

invasive weeds; using grazing to control cheatgrass and comparing seed trampling by sheep vs. disking and drilling as re-vegetation methods; and using grazing to manipulate vegetation to desired wildlife habitat goals.

Impact

The conference generated a tremendous amount of interest in this rapidly growing area of weed management. Mark Elustondo a Nevada rancher attending the conference said "For me the take-home message was that controlled grazing of weedy areas in early summer prevents seeding and restrict plant growth followed by a fall grazing to remove plant limits the weeds so severely that grasses and desirable plants are able to dominate in less than two years." Still other attendees indicated that there is obviously money to be made with these ideas. Carlton Waverly, a small goat producer from California, stated that "leasing my herd to graze other folk's weeds is the best idea I've heard in some time. The animals are fed and I'm paid for it."

When all was said and done, the conference drew in over 250 people from 17 states and Canada, with participants representing everything from state/federal agency professionals, producers/practitioners, to the environmental community and other interested citizens.

Source of Funding

State: Nevada Agricultural Experiment Station, Nevada SARE
Non-government Organizations: American Sheep Industry Association

Scope of Impact

Western Region

Theme: *Water Quality*

Title: Doing Its Part In The Effort To Conserve Regional Water Supplies

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 1987, 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's Agricultural Experiment Station 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. By diverting effluent to the ranch, over 2.9 million pound of dissolved solids did not enter the river. That is equivalent to 150 large dump truck loads of waste not polluting Reno's water supply.

Conversely, over 3,600 acre feet per summer of pristine Sierra-Nevada runoff remained in the Truckee River as the UNR ranch released its dependency on standard water rights to the river.

Source of Funding
State: Nevada Agricultural Experiment Station

Scope of Impact
State Specific

Theme: *Water Quality*

Title: Can Bioreactors Be Used To Clean Up Leviathan Mine, California – A Super Fund Waste Site.

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 release of the metals. In this process, a carbon source is used to biologically reduce sulfuric acid to hydrogen sulfide, followed by precipitation of divalent 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. The bioreactor has now successfully treated waste water from the mine for over six months and is removing approximately 600 mg/L of sulfate (40%), 100 mg/L of iron (99%), 0.6 mg/L of nickel (99%), 1 mg/L of copper (99%), 1.6 mg/L of zinc (99%) and 25 mg/L of aluminum, total dissolved solids were lowered from 2200 to1500 mg/L and the waste water alkalinity was increased to 300 mg/L CaCO3.

Impact

The UNR 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 6000 gallons of water (the maximum flow from Leviathan Mine, CA), remediation efforts could effective 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. It also has shown high success for treatment of zinc contaminated fluids that may not have high acidity.

Source of Funding
State: Nevada Agricultural Experiment Station

Scope of Impact
State Specific

Theme: *Forest Resource Management*

Title: Turning Forest Pest Against Themselves: Can Insect Odors Be Used As A Natural Pesticide?

Issue (Who cares and why?)

Bark beetles are the most destructive pests of saw timber and pulpwood in the United States and are responsible for the loss of billions of cubic feet of coniferous timber each year. Their depredations were particularly severe in western Nevada and California, where the normally high biotic stress on conifers due to bark beetle colonization had been exacerbated by an extended drought. If the current three year draught is extended by a few more dry years, outbreak conditions could return. Bark beetles cause direct economic losses, alter timber management strategies, and create excessively high fuel loads, thereby increasing the chances for catastrophic forest fires. In the Tahoe Basin, bark beetles killed almost one-third of the conifers during the last draught, from 1986 to 1994. Especially hard hit were Jeffrey pine, lodgepole pine and white fir. In some areas, 75% of the trees were killed by bark beetles.

With increasing public concern about the use of toxic pesticides to control insects and other pestiferous organisms and the lack of effective control techniques for bark beetles, resource managers are turning toward other techniques of integrated pest management. Some of these techniques are "hi-tech", such as the use of odors called semiochemicals, and in particular, pheromones, to manipulate the behavior of insect pests. Bark beetles rely on 'aggregation pheromones' to successfully colonize and kill trees, so understanding how they are produced may lead to better control strategies.

What has been done?

University of Nevada researchers are working on understanding the regulation of pheromone production in bark beetles. When this work was initiated at UNR in the early 1990s, it was thought that bark beetles used the turpentine chemicals from the pine tree, the chemicals that give the pleasant odor to pine trees, and made them into pheromones. UNR researches discovered that this is not the case, and that bark beetles make the pheromones from scratch. A hormone that is usually used to control development and reproduction in insects, called 'juvenile hormone' has been recruited to regulate pheromone production in adult bark beetles. UNR scientists have determined the biosynthetic pathways used by bark beetles to make pheromone and discovered that the key enzyme regulating pheromone production is the same enzyme that regulates cholesterol production in humans. They have also isolated, cloned, and modeled another key enzyme in pheromone production, GDS, an enzyme that does not exist in other animals.

In contrast to most other insects, UNR scientists have determined that bark beetles use mid-gut tissue to produce pheromones. The normal course of events is that feeding on a new host tree triggers juvenile hormone production which then increases pheromone production in the mid-gut. The pheromone molecules then enter the gut tract and are literally pooped out to attract other beetles.

A genomics approach has been successfully utilized to gain an understanding of the myriad of other mid-gut enzymes affected by juvenile hormone to induce pheromone production. A technique that has great potential to interfere with specific enzymes is RNA interference, and this approach is now being used in attempts to interfere with pheromone production.

Impact

Thus far, researchers at the University of Nevada have fashioned weak congregating pheromone cocktails that attract hungry bark beetles. These cocktails are now being explored in mass trapping experiments with pine bark beetles and have resulted in millions of insects attracted specifically into traps and away from trees. Another promising project is attempting to synthetic produce pheromones that attract males away from females that are willing to mate, causing a reduction in mating.

Though the investment cost to develop these environmentally benign methods of managing pest is substantial, commercial cost of many products are now as low as $0.25 per trap. Taking into consideration that from 1996 to 1998 five interstate forest fires in eastern Sierra Nevada forests chronically infested with bark beetles claimed $40 million in housing and property damage, timber loss, and soil stabilization costs. California Department of Forestry Andrea Tuttle stated that "investing into this line of research will only save dollars for both California and Nevada in the long run".

Source of Funding

Federal: USDA - Hatch Act & NRI, National Science Foundation
State: Nevada Agricultural Experiment Station

Scope of Impact

Multistate Research (W-189) AR, AZ, CA-B, CA-D, CA-R, CO, FL, MT, NV, TX

Theme: *Wildfire Science and Management*

Title: Evaluation Of Range Management Systems For Post Wildland Fire Grazing

Issue (Who cares and why?)

A major portion of Northern Nevada has burn 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 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 preceding 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.

Source of Funding

State: Nevada Agricultural Experiment Station

Scope of Impact

State Specific

Theme: *Forest Resource Management*

Title: Reforestation: Optimizing Seedling Growth With The Right Formula

Issue (Who cares and why?)

Rapid successful establishment of forest tree seedlings has been a major goal for decades on private, state, and federal lands in the Intermountain West. Reforestation laws throughout the region have been amended over the years to ensure that lands ravaged by fire, insects, disease, mining, and harvesting are successfully regenerated within five years. Improvements in seedling quality through better nursery practices and advances in vegetation control methods have led to a long term successful record in reforestation in the region.

It is not enough any more to plant trees and come back later to see how they are doing. Survival is not a 'given' for all sites, especially those with poor soil quality and little or no rain. The current issue is how to attain the greatest growth out of a seedling within the first few years after outplanting. This urgency is the impetus for seeking new innovative ways to successfully reforest land.

What has been done?

This research was designed to evaluate the potential of controlled release fertilization, fungal inoculation and the application of agricultural lime and/or composed organic matter to aid in establishing pine seedlings in Sierra Nevada's most forbidding landscapes. Eight controlled released fertilizers applied at high and low rates, inoculated and non-inoculated seedlings, and seedlings planted with and without supplemental composed organic matter or lime were the types of treatment included in the study. Treatment effectiveness was assessed via seedling survival/growth and root system development. Examination of macro and micro nutrient absorption, toxic metal uptake and seedling water relations demonstrated the mechanisms by which these treatments influence seedling performance.

Impact

Reclamation of mined sites is a daunting task under the most ideal conditions. In the Sierra Nevada mountains conditions are no where near ideal. It is a wonder anything ever comes back, with soils so acidic that the majority of trees typically found in the area struggle when planted and with trace amounts of rain during the growing season seedlings simply wilt in holes. Nevertheless, through carefully designed experiments, our

scientists have found the most productive methods of reforesting the 247 acres on one of worst mine sites in the Sierra Nevada.

This research was not limited however to just surface mines. Over the past several years, the USFS has utilized the methods developed for mine site reforestation and applied it to burned areas across the eastern slopes of the Sierras and Great Basin. To date, the methods developed in part by UNR scientists are being used to reforest the Crystal Peak fire (7,300 acres), Cottonwood Fire (5448 acres) and Martis Fire (14,500 acres).

Source of Funding

Federal: McIntire-Stennis
State: Nevada Agricultural Experiment Station

Scope of Impact

Western Region

Theme: *Forest Resource Management*

Title: Production of Containerized Pine Tree Planting Stock for Harsh Environments

Issue (Who cares and why?)

Natural resource managers in the Great Basin and eastern Sierra Nevada are routinely charged with the task of restoring forests and woodlands on sites where trees have been lost due to wildfire, insects, harvesting, disease and mining. With increasing losses, the need for identification of tree species and establishment techniques suited to arid and semi-arid zones is a top priority. The need for development of regeneration techniques for pine trees has long been recognized, but efforts to formulate reliable artificial regeneration strategies have been hampered by a lack of information on planting stock production procedures.

Earlier work on western conifers reported that restoration was greatly facilitated by containerization. However, development of production techniques for planting stock specifically targeted for the harsh environment of the Great Basin and eastern Sierra Nevada has been limited. It is our reasoning that the attributes of containerized pine seedlings are likely to prove critical on arid and semi-arid sites.

What has been done?

This research was designed to evaluate the potential of symbiotic fungal inoculation and controlled release fertilizers to facilitate the establishment of containerized Singleaf Pinyon, Sugar and Jeffrey pine seedlings on adverse sites in the Sierra Nevada. Five controlled release fertilizer and one water soluble fertilizer were incorporated into the containers, which had been inoculated with Pisolithus tinctorius (symbiotic fungus). Each fertilizer was applied at high, medium, and low rates. Non-fertilized seedlings and non-inoculated seedlings constituted control treatments. Height and stem diameter were measured at 6 and 15 month after sowing, and foliar tissue samples were also collected and analyzed for N, P, K, Ca, Mg, S, Fe, Zn, Mn, Cu, B, Mo, and Al. Foliar analysis provided for a mechanistic interpretation of the effects of each main treatment and interactive treatment effect on seedling performance.

Impact

In today's forests, tree planting helps speed the reforestation process. Continuing advances in research have resulted in higher-quality seedlings, improved planting practices and a greater survival rate-up to 85% of replanted trees. Forest nurseries are an important part of this reforestation process. In just one growing season, the Nevada Division of Forestry, Washoe Nursery produced over 100,000 containerized seedlings adapted to the exceedingly rigorous growing conditions of the Great Basin and eastern Sierra Nevada environment. The containerized production techniques used by Washoe Nursery were developed in part by UNR's scientist. These techniques proved vital in insuring seedling survival once transplanted to the field.

Source of Funding

Federal: McIntire Stennis
State: Nevada Agricultural Experiment Station

Scope of Impact

State Specific

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 economic impact of operating a guest ranch as well as 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.

Federal and State Funding by Plan of Work Goals

	Goal	Federal $	State $	County	Total $	FTE
Nevada Agricultural Experiment Station	**V**	**346,013**	**531,505**		**877.518**	**7.5**
University of Nevada Cooperative Extension	**V**	**604,861**	**2,739,701**	**2,924,858**	**6,269,420**	**82.05**

Theme: *Youth 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. In some states, the costs for incarceration exceed the budget for education of all school-age children. Statistics also indicate that Nevada has fallen from having one of the best graduation rates in the country to one of the worst. Several Nevada studies indicate that taxpayers support prevention programming. In a recent survey of Nevada's rural counties, 71 percent of the local population indicated support for increased spending for programs that might prevent juvenile crime. A recent 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, a collaborative prevention program designed 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 (ID). 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.

Due to the large numbers of offenders, some communities are only putting the highest-risk youth on probation. Now, some communities have begun to accept referrals from schools as well. Also, several Native American sites provide tutoring in addition to the 30-hour MAGIC curriculum; this will be expanded to other sites. The Las Vegas program targets entry-level juvenile offenders ages 11 to 18 and their parents; they are court-ordered to participate. Volunteer alums of this urban program are peer facilitators who assist the staff in program delivery, which also includes an anger-management component.

Impact:

The national award-winning Project MAGIC has graduated more than 1,000 juvenile offenders in rural counties who have not reentered the justice system, saving taxpayers an estimated $5.4 million in incarceration costs for the 18 percent who statistically would have reoffended. A follow-up study of 100 teen graduates shows they increased their skills in decision-making, conflict resolution, goal setting and communication. There was a decrease in the number of program graduates who indicate their families insulted and yelled at each other, and a 48 percent decrease in graduates who indicate their families have serious arguments.

In 2002, more than 450 youth participated statewide; the average age of participants was 15. In Las Vegas, 265 youth graduated from the program, representing an 88 percent completion rate. In their self-evaluation, the youth rated their life skills with a score that resulted in a 72 percent improvement. Thirty-two percent of youth reported hardly missing school compared to 68 percent in the post-test. In the pre-test, 32 percent of youth said their interests did not include use of drugs or alcohol compared to 75 percent on the post-test. The changes between pre- and post-test scores revealed an improvement of 74 percent in youths' knowledge and abilities in the life skills taught. Among the 265 youth graduating, 19 had increased levels of involvement with the justice system, resulting in a 7.2 percent recidivism rate. Clark County Probation reports that other program participants have an average 32 percent recidivism rate. Clark County detention rates are $135 a day, with an average stay of 60 days. A significant reduction in recidivism for youth means a significant economic impact for the county.

Source of Funding:

Smith-Lever funds
State Matching funds
County
Grant

Scope of Impact:

Multistate Extension (NV and ID - reservation)

Theme: *Youth At Risk*

Issue:

Child abuse is a very real problem for Nevada. In 2000, 3,441 reported occurrences of child abuse were substantiated by social workers, making Nevada one of the nation's most susceptible states to incidences of child abuse. People who work closely with children reported most of these cases. Teachers, counselors, healthcare workers and caregivers are all valuable sources in detecting child abuse. Childcare providers and youth workers are mandatory reporters of suspected child maltreatment. Many organizations employ adult and teen workers and volunteers to work with children. They may suspect when child abuse is occurring, but often don't know how to report it. These youth workers need to be educated about the signs and symptoms of child abuse, and how to react and report when child abuse is suspected. The prevention of family and community violence was identified in Nevada needs assessments as an area of prime concern. Nevada has very high rates of these devastating interactions.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) is known for its program that helps people report suspected cases of child abuse and neglect. Youth specialists developed a three-hour curriculum for youth workers and others, a three-hour workshop for childcare providers, a curriculum guide and a self-study guide to help youth workers and volunteers recognize and report suspected child abuse. Professionals train youth staff, volunteers, administrators, child caregivers, crisis line staffers and firefighters. Training has been provided to UNCE staff and volunteers, as well as staff and volunteers of other youth-serving agencies. *Child Abuse Recognition and Reporting Self Study Guide* is a 50-page book that introduces workers to the many facets of child abuse. It helps youth workers learn the potential indicators of child abuse, how to respond to a disclosure from a child, and where and how to report their suspicions to authorities. Each chapter features a comprehensive quiz that allows youth workers to monitor their retention of information. The book is available for purchase for $5, or is available in PDF format or in an interactive version at: www.unce.unr.edu/publications/child.htm

Impact:

Youth workers who are more informed about child abuse are able to provide safer and more secure environments for the children they help. The guide is an effective learning tool because users must answer questions to ensure they understand and are retaining the material. The web-based self-study guides allow workers to study at their own pace and monitor their progress. The guide was first created for volunteers working in UNCE programs such as 4-H, but its success has made it popular with other groups as well. Social-service agencies, district attorneys and healthcare providers throughout Nevada, other states and other countries have adapted the program to train their employees to be on the lookout for signs of child abuse.

In 2001, the self-study guide received the Western Regional NEA4-HA Communicator Award for an outstanding educational piece. In 2002 it received a Second Place National Award for an Educational Publication from the National Extension Association of Family and Consumer Sciences. It was approved for childcare provider training by the Nevada State Childcare Licensing Bureau. The guide is now required training for all UNCE staff and volunteers. Additionally, it has been obtained by more than 200 people from 32 states and 11 countries. Pilot testing evaluation of the self-study guide indicates that users significantly increase their knowledge regarding recognizing and reporting suspected child maltreatment. Additional evaluation data is being collected.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific

Theme: *Literacy*

Issue:

The foundation for literacy is built during the preschool years. A preschool child between the ages of 1 and 6 who spends 15 minutes a day reading with an adult will have 455 hours of individual reading instruction before entering school. This reading time fosters children's interest in reading and builds confidence, while eliminating some of the severe consequences of poor literacy skills including grade retention, school failure, school dropout, delinquency, unemployment and underemployment. The Nevada Literacy Coalition estimates that nearly 25 percent of youth and adults in the state have inadequate literacy skills, placing Nevada's children at extremely high risk for developing illiteracy related problems in the future. The percentage of Spanish-speaking immigrants is expected to increase in Nevada over the next 25 years, and so it is likely that ever-larger numbers of children who are English language learners and at risk for low achievement will be entering schools. Parents with limited language skills cannot always teach their preschoolers. Breaking the cycle is important to insure that preschoolers have reading skills in order to succeed.

What Has Been Done:

Family Storyteller is a literacy program aimed at encouraging and training parents to play a vital role in the literacy development of their children. The program, developed by University of Nevada Cooperative Extension (UNCE), KNPB-TV, Washoe County Libraries and the Washoe County School District, creates an opportunity for parents and young children to interact around literacy and language activities. It is designed especially for families that may have limited language skills and few children's books at home. In 2002, three program thrusts were pursued – continuation of the original program, development of a version for English language learners, and development of a version for families with mothers in prison.

Family Storyteller is a series of workshops targeting families at risk for low literacy and related problems. Each workshop includes a 10-minute video viewing, book-reading techniques, practice time for reading to children and other literacy activities. In 2002, the program was conducted at 17 sites reaching 170 families. In addition, UNCE trained volunteer workshop facilitators throughout Nevada, reaching 89 people – they in turn conducted 17 more series, reaching 139 families.

A second program thrust was to pilot a program for English language learner parents and their 3- to 7-year-old children. Cuentos en Familia involved a collaborative planning team which received grants to develop and test the program. It enhances the traditional six workshop sessions to help parents learn to read the children's books in English, three new videos of parents and children reading together, and new take-home packets of books and literacy extender activities.

A new Family Storyteller thrust is Behind Bars, a prison-based family literacy project. It targets families with mothers soon to be released from prison (More than 70 percent of Nevada's incarcerated women have children and will return to the family as primary caregiver). The program prepares these women to develop skills resulting in more positive functioning within the home and greater school success for their children. The project begins in early 2003.

The program also expanded to Las Vegas, where Family Storyteller is taught in both English and Spanish – in homes and in group settings. The six-week parent-child interactive reading program uses children's literature, hands-on crafts and videotapes.

Impact:

Family Storyteller was designated a national Program of Excellence for family development and resource management by the Cooperative Extension System. An evaluation of facilitators trained at rural sites in 2002 revealed that 100 percent rated the curriculum useful or extremely useful in meeting their program needs and the needs of their families; the reaction of parents was reported as very positive.

Evaluation of Cuentos en Familia is underway, but preliminary results indicate that parents have: become more comfortable reading books to their children; noticed their children learning new English words; their children's attitudes toward books have changed; and learned new positive guidance techniques.

A two-year evaluation of the program in Las Vegas shows a satisfaction increase in four out of six categories in the classes taught to English-speaking participants. The Spanish evaluations revealed a significant improvement for both English and Spanish participants in the increased number of children's books present and visible in the home. One hundred follow-up telephone surveys showed that parents were spending more time reading to their children and reading more often, and there was a substantial increase in children's books in the homes.

Source of Funding:

Smith-Lever funds
Hatch funds
State Matching funds
Grant

Scope of Impact:

State Specific

Themes: ***Literacy, Youth Development, Youth At Risk & Workforce Preparation***

Issue:

Washoe County, in western 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 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 conflict resolution, communication skills, self-responsibility, decision-making and good nutrition. Youth who have these life skills are less likely to participate in risky behaviors. Additionally, the programs helps youth complete their homework by providing quiet space, materials, support and encouragement, as well as utilizing the Search Institute's Assets Model to build on youth's internal and external assets. 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, ages 6 to 12. Funding was obtained to conduct the programs at three high-risk elementary schools in Washoe County and three Reno Housing Authority community rooms. The children receive a snack and help with their homework, and participate in other activities including reading and educational games. Literacy skills are emphasized. Also offered are family centered activities such as family nights and a family newsletter, written in both English and Spanish. Staffing opportunities have been expanded through university student work-study and internships, offering students real-life experiences before entering the workforce. In 2002, 19 staff provided the program for nearly 650 youth.

Impact:

Previous 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.

During 2002, four sites were evaluated using the School-Age Care Environment Rating Scale. On a scale of 1 (inadequate) to 7 (excellent), all sites rated either 6 or 7, with the exception of one question rating interactions between staff and parents, where the rating was 4 or 5. The family nights were instituted following this rating to ensure that opportunities to interact with parents are available. Evaluations will continue in 2003.

Nevada's 4-H After School Club also received a 4-H/Youth Program of Excellence recognition from the national Cooperative Extension System.

Source of Funding:

Smith-Lever funds
State Matching funds
Grant

Scope of Impact:

State Specific

Theme: *Child Care & Literacy*

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. Studies of Nevada's child caregivers indicate that only 16 percent of caregivers have two or more years of early childhood education. Turnover of caregivers is very high – 45 percent, according to the 2002 Nevada Childcare Work Force Study.

What Has Been Done:

The Nevada State Childcare Licensing Bureau provided funding for University of Nevada Cooperative Extension (UNCE) to develop, implement and evaluate a three-hour workshop for child caregivers. It is called Buckaroo Bunny Reading Roundup: Literacy Development and Activities for Children 3- to 8-years-old. The program includes: discussion of literacy development; choosing and reading books for preschoolers and beginning readers; a video designed specifically for the training; and hands-on activities to extend the literacy and language learning found in books. The program goal is to increase the knowledge and skills of childcare providers about early literacy development.

In 2002, 140 caregivers participated in 15 workshops given in 10 locations statewide.

Impact:

The UNCE team's childcare program was designated as a national Program of Excellence for family development and resource management by the Cooperative Extension System. A McNemar pre-post evaluation of the Roundup workshops found that participants showed significant gains in knowledge of the components of literacy development, and knowledge of techniques for reading to groups of young children. On a scale of 1 (not helpful) to 5 (very helpful), 97 percent of workshop participants gave the workshops a rating of 4.74 in helpfulness and 4.79 in instructor effectiveness. Among the childcare providers attending the workshops, more than half worked in centers, 14 percent were family day-care providers and 13 percent were center directors. They reported working with from one to more than 36 children. Although the education was designed for beginning caregivers, only about a quarter of participants were in this category (one to three years in the field); nearly 25 percent had worked in childcare for 16 or more years.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific

Theme: *Child Care*

Issue:

Many Nevada childcare workers are undereducated and ill-prepared to deal with daily interactions with children. *Working Mother* ranked Nevada 47th in the nation in quality of childcare. Caregivers need to be trained in the basics of child development; however, many do not have the time or money to attend traditional classes. A new method was needed to reach caregivers and offer them training in a way that was less time consuming, costly and difficult to access.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) created Caring4Kids, a new system of training entry-level childcare providers throughout Nevada. Caring4Kids is a series of training modules including videos, self-

study guides and tests. They are free and available at 65 Nevada public libraries, Cooperative Extension offices, the University of Nevada's Human Development and Family Studies Department and county childcare licensing offices. Interested childcare providers can check out the modules, read the self-study guide and watch a video, complete the training at their own pace and earn approved in-service training hours. There is also an evaluation component; caregivers may volunteer to complete the evaluation in addition to the educational materials. The study guide can also be downloaded from the Caring4Kids website at: www.unce.unr.edu/publications/caring4kids/caring4kids.html

Modules on Cognitive Development and Food Safety in Childcare Settings are currently available and approved for three hours of childcare training. Two additional modules are in progress: Nevada Child Care: Getting Started in Your New Profession; and Child Abuse Recognition and Reporting.

Impact:

Childcare providers now have plenty of options to receive childcare training. The Cognitive Development module has been checked out in libraries nearly 700 times since its distribution in 2000. Of the 78 caregivers who responded to the evaluation, 87 percent reported the activities helped them better understand cognitive development in children. Seventy-two percent indicated they would use the information in the training module "quite a bit" or "a lot" to change the way they work with children. Nearly all respondents said they would implement, continue or increase the use of nearly all the strategies provided in the training. The Food Safety module has been checked out of the libraries and resource offices more than 200 times in the year it's been available. Of the 68 caregivers responding to the evaluation, 63 percent said they used the information to change the way they work with children. The content and format of the module, reading level, length and helpfulness were rated high. There was significant improvement in the knowledge gained from use of the module in all but one of the questions.

Comments from caregivers indicate they appreciate being able to get their training in an independent study environment because it is difficult for them to attend formal training sessions. The data indicate the modules are being widely used across the state. The public library system continues to be the most popular and convenient access point. Another indicator of the impact of the training module series is the number of requests for and use of materials in the Nevada Child Care Workforce Study. One-quarter of caregivers surveyed indicated they had used the training modules, a higher number than expected given the short time they had been in circulation.

Source of Funding:

Smith-Lever funds
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. Home visitations and group parenting classes promote positive parenting practices and improve child health and development, thereby preventing child abuse and other poor childhood outcomes. Key personnel in collaborating agencies named parent education as one of the three top social-service needs; they refer clientele to the University of Nevada Cooperative Extension (UNCE) Partners in Parenting (PIP) program. 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 helping children and families to realize their fullest potential. PIP is the umbrella for Nuevas Famillias, Children's Literacy and Childcare Provider Training. Curricula is used interchangeably by the PIP staff and is available in both English and Spanish. What began as a voluntary, home-visitation program has expanded to group classes in order to reach more people. The class curriculum consists of: Fun to Play (young parents interact with their children); West Ed. Child Development (parents learn child brain development); RETHINK (parents receive anger management training); SIDS (parents receive Sudden Infant Death awareness curriculum); and *Little Lives* newsletters (parents receive age-paced monthly newsletters).

In 2002, a total of 279 classes were taught, reaching more than 10,300 English- and Spanish-speaking participants, including group classes and home visits. About 40 percent of these parents and children were English-speaking; 60 percent were Spanish-speaking. Classes were conducted in Las Vegas, North Las Vegas, Henderson, Pahrump, Overton, Logandale and Mesquite. Nearly 2,000 *Little Lives* newsletters, in both English and Spanish, were sent out monthly in Clark County, and more than 45,000 distributed statewide.

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 RETHINK and control anger. The SIDS awareness program produced the most spectacular results. Because of the high incidence of SIDS deaths in southern Nevada, classes in both English and Spanish began in 2000. Of the nearly 1,000 parents (one-third English-speaking and two-thirds Spanish-speaking) who received the program, 92 percent increased their knowledge of SIDS risk factors, 91 percent put their infants to sleep on their back, and 99 percent of Hispanic parents put their infants to sleep on their back (there had been great reluctance in the Hispanic community to do this because of traditional practices). In addition, 41 childcare centers (nearly 700 childcare providers) received this training, and the Nevada State Office of Early Care and Education is using UNCE's SIDS curriculum statewide. Furthermore, there was a dramatic drop in SIDS deaths in Clark County; in 1999, there were 20; this number dropped to 13 in 2000 and down to 8 in 2001.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

State Specific

Theme: *Community Development*

Issue:

The Laughlin, NV and Bullhead City, AZ region is considered one of the fastest growing rural regions in the nation. Sustaining growth in their mutually dependent population and economic base is their primary goal. To achieve this goal, community leaders from both cities and surrounding communities requested that University of Nevada Cooperative Extension (UNCE) provide leadership and technical assistance programming to: create a community-based advisory committee; locate and analyze economic, fiscal and social data; build community awareness of economic, fiscal and social indicators; measure economic leakage and develop strategies to improve local spending; improve local business retention and identify expansion opportunities; and conduct needs assessment to improve quality of life.

What Has Been Done:

UNCE developed and implemented a five-year program, including the establishment of a 14-member regional advisory committee. In 2002, UNCE and the committee analyzed more than 25 demographic and economic indicators using 2000 census data and disseminated the results through community presentations, print and TV media. The regional economic model was updated using newly defined trade areas and a multi-regional, input-output model was developed. Several economic segments were surveyed for operating expenses and revenues (casinos, recreation, power plant, selected retail outlets). The model was completed and used for community policy decision-making and education. Data identification and analysis was taught to the advisory committee to assist with future community planning. Primary data was collected from more than 400 water user visitors over two weekends; a water user profile was developed and expenditure data used to estimate the economic impact this tourism segment has on the regional economy.

Impact:

The regional community has become very proactive and responsive to internal and external forces that impact residential quality of life. In 2002, using a 5-point Likert Scale, advisory committee members were asked to rate UNCE's overall program. The results are: content (4.55), presentation (4.65), increased knowledge (4.50) and future application (4.35). The analysis of 2000 census data was used for grant applications and also for recruiting Super Wal-mart and Home Depot. Quantifying the impact of tourism in the region assisted in the successful raising of nearly $18 million for Needles Highway improvements (Nevada Legislative Bill AB 465). Laughlin and Bullhead City have lessened economic leakage through ongoing community education efforts using various media channels (print, PSAs and local TV). The $0.52 local spending leakage in 1999 decreased to $0.48 in 2001. This improvement is also a direct result of working with businesses to adjust their operations to meet local consumer needs (i.e., selection, merchandising, advertising). Childcare demand analysis resulted in the construction of a new 24-hour childcare facility. The reports and material put together with the advisory committee also resulted in assessment of the feasibility of Bureau of Reclamation land development for tourism, and the market analysis for a Laughlin Equestrian Complex and Arena.

Source of Funding:

Smith-Lever funds
State Matching funds

Scope of Impact:

Multistate Extension (NV, AZ)

Theme: *Child Care*

Title: Who's Caring for Nevada's Children

Issue (Who cares and why?)

As parents struggle to balance the demands of work and family, child care has become a daily reality for more than 13 million children nationwide. The child care system has value not only for children and parents, but for the broader society we all live in. When our children are well taken care of and parents are supported in their ability to work, we all benefit.

While in the past child care has been viewed as little more than a service that allows parents to work, today we recognize that it is more appropriately seen as an early education environment with a powerful effect on child outcomes. If the quality of a child care setting is high, children thrive and develop best; if the quality is low, development can be compromised.

The purpose of this research is to provide the Nevada Department of Human Resources with an analysis of Nevada's child care workforce and to serve as the basis for recommendations that address the issues of the recruitment, retention, and compensation of the child care labor force.

What has been done?

Quantitative and qualitative methods were used to examine data from multiple projects conducted during 2000-2002. To learn more about Nevada child care and the child care work force, information was gathered from 354 child care center directors, 1,577 teachers, 408 licensed family child caregivers, 159 non-licensed family child caregivers, 19 child care licensing staff, and 634 parents. Observations in 103 classrooms provide more in-depth information about the quality of care and children's language, cognitive, and social development. In addition, evaluation of two intervention programs effectiveness was conducted to determine quality of care in select centers. Results were then published in a 231 page report titled "Who Cares for Nevada's Children? A Profile of Demographic, Economic, and Quality Aspects of Child Care in Nevada".

Impact

With data collection completed, a new tool is available in helping caregivers, educators, state and county regulators, along with private interest groups assess the strengths and weakness of a given caregiver "The Caregiver Guidance Database".

Source of Funding

Federal: Hatch

State: Nevada Department of Human Resources – Welfare Division

Scope of Impact

Integrated Research and Extension

Theme: *Promoting Business Programs*

Title: Operating a Guest Ranch in Nevada: Is It for You?

Issue (Who cares and why?)

It has also been maintained that development of recreational enterprises on agricultural land is a method to improve management of wildlife resources. In Nevada, private land is particularly important to wildlife because some of the winter range for game is privately owned. Currently there is little economic incentive to encourage the provision of wildlife habitat on private land. Conversely many landowners recognize that game animals trample crops, damage fences and compete with livestock for forage. Other landowners deny recreational access to their land due to concerns about vandalism and liability. If landowners are considering developing private recreation operations, they need to determine if additional income can be earned by maintaining wildlife habitat and charging recreationalists access fees.

What has been done?

In 2000, Nevada Center for Economic Development (CED) created "Operating a Guest Ranch in Nevada: Is It for You?" a publication to help Nevada's landowners make the most of their property. The publication discusses management issues for ranch recreation and liability and regulatory issues operators may face. It explained how to market their guest ranch, questions potential guest may ask about the ranch and a personal questionnaire to help determine viability. To get the word out, the CED distributed 5,000 copies to all 17 counties of Nevada.

Impact

Of 128 questionnaires received by the authors, all indicated interest in adopting alternative revenue to their traditional ranching incomes. Since the distribution of "Operating a Guest Ranch in Nevada: Is It for You?" four families in Nevada have opened their homes and ranches to the general public. "We used the guest ranch worksheets as an outline for advertising/marketing, plus all the information went straight into our web site" said

Jim Burns owner of the Burns Hermitage Guest Ranch. Owners of the Cottonwood Ranch were interested in starting a guiding company, but were apprehensive about the legalities. "The report did a great job of explaining how we should go about protecting our assets. We felt informed enough that when we finally contacted the attorney we were not being taken for a ride."

According to the Nevada Association of Counties another half dozen recreational ranches are expected to open in the next year, all of which take advantage of information included within "Operating a Guest Ranch in Nevada: Is It for You?"

Source of Funding

Federal: Dept. of Commerce Economic Development
State: Nevada Agricultural Experiment Station

Scope of Impact

State Specific

Theme: *Agricultural Financial Management*

Title: Irrigating Nevada's Pastures In The Face Skyrocketing Utility Bills

Issue (Who cares and why?)

With an unprecedented combination of near drought conditions, an over-commitment of resources by the Sierra Pacific Power Company (SPPC) and wholesale electricity markets meltdown, Nevada's consumers were facing steep rate increases. On November 30, 2001, SPPC filed an application with the Public Utilities Commission of Nevada (PUCN) for authority to increase its annual revenue requirement for general rates charged to all classes of electric customers within its service territory to the tune of $28 million.

To learn more the PUCN held a number consumer session throughout the state to give customers a chance to comment on the utility's rate increases. It became obvious during these sessions that priorities in one part of the state may be different from those in another. Besides the obvious strain on family budgets, ranchers who irrigate their property were earmarked for a 58% increase in charges. To make the case for rancher in Nye county, one ratepayer presented his concerns on the impact of a price hike on production. Although public presentation were well intended, it became clear that a thorough investigation should be conducted before formally PUCN testimony was given.

What has been done?

Based upon a set of potential rate hikes delineated by PUCN staff, University of Nevada investigators developed two economic analyses. The first portion calculated the average rancher's actual cost of pumping water across the possible price increases under different pumping conditions. The second part, based upon the earlier findings, calculated the rancher's bottom line per acre of alfalfa irrigated.

Impact

Power. We need it. We'll pay just about anything we've got to keep it. That gives the companies that make it, sell it and bring it to our homes some leverage, some guaranteed demand. Nevadans now pay more for gas and electricity than Californians. Washoe and Carson City residents pay 1.3 times the national average.

However, based upon the research conducted by the University of Nevada, the PUCN commissioners concluded that a 5% increase in ranch irrigation cost was plenty. In other words, this price cap on average saved ranchers $23/acre that would have otherwise been spent paying utility bills. "It doesn't sound like a lot of money until you consider the fact that last year I planted 473 acres. That $10,000 in my pocket, not Sierra Pacific's" northern Nevada alfalfa grower, Dale Pomeroy.

Source of Funding
State: Nevada Agricultural Experiment Station

Scope of Impact
State Specific

Theme: *Agricultural Financial Management*

Title: Rangeland Fire's Financial Impact on Cattle Operations in Northern Nevada

Issue (Who cares and why?)
During the past several years, northern Nevada has experienced its worst fire years ever with over 2 million acres burned. Estimates of the damage are still being tabulated. However, we know that the economic and environmental impacts of these fires are staggering. Direct economic impacts include things such as fire suppression efforts, lost forage and grazing, lost infrastructure such as fences and other physical structures, and reseeding efforts. Many impacts are unknown at the current time, but will contribute to the total economic impact. Examples of unknown impacts are loss of wildlife and recreation, erosion, loss of life along major traveled interstates and highways, increased maintenance on roads and interstates to keep them cleared, and decreased ecological state of the land. This project is an attempt to provide information relating to economic impacts from the 1999 Rangeland wildfires.

What has been done?
Impacted landowners in Humboldt, Pershing, Eureka, Lander, and Elko Counties were surveyed and data collected utilizing a survey form developed in Eureka County.

Impact
The economic impact on Humboldt, Pershing, Eureka, Lander, and Elko Counties due to the rangeland wildfires experienced in the summer of 1999 were estimated to be $13 million or more. Impacts include lost grazing, rebuilding structures and fences, soil conservation efforts, and reseeding burned rangeland. The long-term solution includes management and seeding rangeland with perennial bunchgrass and shrubs. Although this will not eliminate the fire cycle, it will reduce it.

Funding Source
Federal: USDA - Hatch Act
State: Nevada Arid Rangeland Initiative

Scope of Impact
State Specific

Theme: *Agricultural Financial Management*

Title: Agricultural and Recreational Impacts From River Volume Changes Due to Gold Mining Operations

Issue (Who cares and why?)
Current gold mining technology in the Great Basin is based upon large open pit gold mines that may extend 800 feet below the water table and cover over 500 acres of surface area. This technology requires enormous quantities of water to be discharged from the pits to allow mining to continue. This “dewatering” process required temporary groundwater rights to be granted by Nevada’s State Water Engineer to gold mining

companies in Northern Nevada's Humboldt River Basin. The magnitude of dewatering poses significant externalities on other water users within the basin. For a period of approximately fifteen years, in-stream flows in the Humboldt River Basin will double due to water discharges from pit dewatering. Similarly, downstream users may lose during the post-mining period as massive quantities of water are diverted to fill the abandoned open pits.

What has been done?

A multiperiod programming model was developed to estimate the expected impacts of changes due to flow perturbations resulting from mine dewatering and subsequent filling of pit lakes. The model is thus driven by farmer planting decisions, which are in turn based on expectations of water supplies over the year.

Post-optimality analysis will determine the effects of alternative flow regimes upon recreational users' valuation of water-based activities at Rye Patch. In addition, the impacts of imposing a minimum volume of 3,000 acre feet, suggested by officials of Nevada's Department of Wildlife, were derived to determine benefits to regional recreational users as well as costs on downstream irrigators.

Impact

Nevada ranks third in the world in gold production and these mines have been disposing of 445,000 acre-feet of ground water per year. Approximately 65% of this water is discharged into tributaries of the Humboldt River. This discharge would be worth approximately $223 million if valued at $500 per acre-foot, the current price paid by the U.S. Fish and Wildlife Service to purchase water rights from farmers in a nearby irrigation districts.

However, the major objective of this project was to quantify the loses to downstream users because of rigidities that prevent their ability to take advantage of the increased in-stream flows resulting from mine dewatering. Consequently, estimates were modeled on the premise that 3 acre-feet water right limit were relaxed to 3.112 acre feet (divvying newly available water across total irrigated acres equally). This 3.7% increase in water usage by farmers has the potential to generate $39.3 million over a 5 years period because of higher valued, more water intensive cropping patterns.

The potential for increasing recreational values also exists under the mine dewatering phase with additional institutional changes. Specifically, Nevada wildlife officials maintain that a 3,000 acre-foot minimum volume should be established to avoid loss of the sport fishery at Rye Patch reservoir. Imposition of this requirement has no impact on agricultural irrigation values during the mine dewatering phase. Annual visitor values increase an average of $1,823 during dewatering with the minimum volume constraint.

The results of this economic analysis clearly indicate that lack of institutional flexibility may limit the ability of downstream users to enjoy temporary gains from the increased flows during gold mining activities.

Source of Funding

Federal: Environmental Protection Agency

State: Nevada Agricultural Experiment Station

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 in both 2001 and 2002. 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 also initiated a series of statewide "community stakeholder meetings." These continued in 2001 and 2002. In addition to the general public, "key community stakeholders" from each individual community/county are invited to participate in an open meeting with all of UNCE administration (Dean/Director, Assistant Director, Area Directors, Fiscal Officer, Communications Specialist, AA/EEOC Officer). At this meeting, comments, suggestions and issues/concerns are solicited from participants. The focus is on issues/concerns as they relate to UNCE programs and the University of Nevada overall. This past year 6 "community stakeholder meetings" were held, in mostly very rural communities, and involved over 100 individuals. This information is being used for developing both local and statewide programming, and is posted on the web at: http://www.unce.unr.edu/what's%20new/Community%20Tour%20Survey.pdf. Information is used in strategic planning and in program planning. It has also been shared with colleges and departments at the University.

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.

As a result of the above formal 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 our programming. Finally, the NAES has created a web page 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 since the last 5-Year Plan of Work.

EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES

University of Nevada Cooperative Extension (UNCE) and the Nevada Agricultural Experiment Station (NAES) 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.

Integrated and multistate programs have generally realized the outcomes/impacts expected by this date. Since they are in different stages of development, not all programs have reached the stage where full impacts/accomplishments may be 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. All current projects are progressing well.

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. 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.

In 2001, we created a joint funding mechanism between extension and research for integrated activities, and proposals were requested. The intent of this Request for Proposals was to facilitate and support joint research-Extension programming between UNCE and NAES to benefit the people of Nevada. Proposals were solicited, and were reviewed by a committee of deans and department chairs from Colleges of Agriculture, Human & Community Sciences, Cooperative Extension and the Experiment Station. Eight (8) small one-year projects/programs were funded to stimulate combined research and Extension activities between UNCE and NAES, and included faculty from the Colleges of Agriculture and Human & Community Sciences. Projects funded include those to 1) help initiate or facilitate start up of a new integrated project/program; 2) enhance an existing project in new ways; 3) plan for future projects; 4) secure future project support from other sources; 5) build awareness or 6) provide "one time" funding for a new or expanded piece of a larger on-going project. All of these approved projects include a partnership/collaboration between campus-based NAES faculty (from the Colleges of Agriculture, and Human & Community Sciences) and community based Cooperative Extension faculty, and address issues important to our stakeholders. These projects were funded through FY2002. At the conclusion of FY2002, both oral and written project reports were presented to the deans and department chairs of the College of Agriculture, Biotechnology and Natural Resources and Cooperative Extension. All felt that these had been beneficial and worthwhile integrated efforts.

MULTISTATE EXTENSION ACTIVITIES

See Appendix "A" for Multistate Extension Activities with brief statements on the progress to date of each planned multistate Extension program or activity**.** 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.

INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

See Appendix "B" for Integrated Extension Activities with brief statements on the progress to date of each planned multistate Extension program or activity**.** 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.

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

University of Nevada Cooperative Extension
Multi-State Extension Activity

Title	2002	2003	2004	2005	2006	Statement of Progress
Age-paced Parenting Education	$3,892.69	$4,048.40	$4,210.33	$4,378.75	$4,553.90	Reaching parents just when they need information has proven to be an effective method for helping new parents understand their baby's development, nurture the new child, prevent child abuse, provide age-appropriate learning activities, and support the spousal relationship. Considerable work has gone on at the state and national levels with regard to age-paced parenting programs.
Capacity Building in Extension Child Care Programming	$778.54	$809.68	$842.07	$875.75	$910.78	Teamwork in state and national childcare efforts in 2002 build capacity to improve child care quality. A team member served on the Nevada State Child Care Advisory Committee and chaired its most active subcommittee on Quality, Training and Licensing (QTL). The State Committee met on a quarterly basis to recommend use of funds for child care subsidies and quality improvement.
Carson River Coalition	$1,163.90	$1,210.45	$1,258.87	$1,309.22	$1,361.59	The Carson River Coalition is the first in the country of its size to implement a entire watershed plan. Agencies, individuals, counties, ranchers, recreationists and others are involved in this nationally recognized project to improve and sustain watershed health. This project is an effort of the Education subcommittee.
Carson River Watershed Education Program	$7,357.36	$7,651.65	$7,957.72	$8,276.03	$8,607.07	The Carson River Coalition (CRC) continues to support a watershed awareness campaign. The coalition recognized the need for a program on protecting water quality, as new EPA regulations are imminent. The Coalition and the State of Nevada have supported the new Carson Valley Water Quality Education Program (CVWQEP). This committee wrote the first drafts of half of the text panels for our new Watershed map.
COIN	$1,273.74	$1,324.69	$1,377.68	$1,432.79	$1,490.10	COIN is short for California, Oregon, Idaho, and Nevada and is an annual meeting as well as a subscribed email list of the Extension Specialists and Extension Educators in those states plus Utah for the purpose of sharing information on programs in each of those states. It is an invaluable resource for extension personnel in agriculture and natural resources.
COIN	$2,291.43	$2,383.08	$2,478.41	$2,577.54	$2,680.65	Multi State program with the goal of information exchange on emerging issues and valuable programs. Yearly meeting held rotating through the four states involved. Now taking leadership on development of a COIN web site.
Commercial Water Conservation Training Program (Desert Green)	$7,508.16	$7,808.49	$8,120.83	$8,445.66	$8,783.49	The Commercial Water Conservation Educational Program is designed to educate commercial clientele in the Green Industry as well as others who have an interest in water conservation issues. This program is in its sixth year, and is moving toward maintenance. Each year the program is evaluated, reviewed, modified, and revised according to the needs of the clientele.
Cattlemen's Update	$3,184.35	$3,311.73	$3,444.20	$3,581.96	$3,725.24	A series of meetings held for ranchers on practical aspects of ranching. There are informational talks given on topics directly related to ranching, and are attended by 300-400 ranchers per year.
Desert Bioscape	$7,508.16	$7,808.49	$8,120.83	$8,445.66	$8,783.49	Desert Bio-scape is a program that takes a holistic approach to the conservation of natural resources in the urban setting. The goal of this program is to teach homeowners and commercial clientele to conserve water and energy, reduce pesticide and chemical fertilizer use, and promote wildlife habitat in a sustainable manner. This program contains several components, including wildlife and conservation landscaping, constructed home wetlands for water recycling, a research project to find and determine water-efficient plants for the southern Nevada area, and a research project to determine the use and benefit of natural organic mulches in the Mojave Desert.

Title	2002	2003	2004	2005	2006	Statement of Progress
Healthy Child Care Nevada	$3,892.69	$4,048.40	$4,210.33	$4,378.75	$4,553.90	There are three major thrusts associated with this grant-funded program: establishing a Child Care Health Consultation network in Nevada, a study of the National Health and Safety Performance Standards compared with the Nevada Child Care Licensing Regulations, and enrolling children in the Children's Health Insurance Program through child care providers.
Horticulture/Natural Resources Education	$1,643.10	$1,708.83	$1,777.18	$1,848.27	$1,922.20	The Moapa and Virgin Valley areas are experiencing rapid growth. Most new residents are not accustomed to growing conditions in the desert. Landscape and garden plants and products are expensive. Residents who obtain and use localized planting/growing information are more likely to be successful. Cultural practices of many residents encourage growing and preserving food. It is important to make current information available to all who could benefit. Our program includes classes, demonstrations/tours, supporting the horticultural exhibits at Clark County Fair, Trees on Wheels (Nevada Division of Forestry tree sales), demonstration gardens, newspaper articles, printed materials, providing special-request classes for local groups and answering phone/walk-in questions as well as a few trouble shooting home visits.
Inside Beef and Risk Management	$9,811.76	$10,204.23	$10,612.39	$11,036.89	$11,478.37	Seventy-seven percent of respondents to UNCE's needs assessment survey (Torell R. FS 02-01) ranked marketing, risk management and retained ownership education as the third highest educational need for UNCE to address. The beef cattle market is cyclical. Historically, cattlemen make money in the up years and lose money in the down. Utilizing the Chicago Mercantile Exchange's feeder and live cattle futures and options commodity contracts can minimize the impact of the fluctuating cash market. Offsetting positions limit the downside of the cash market resulting in profitability for beef producers. Agriculture producers are reluctant to participate in something they don't understand. The learning curve for futures and options, relating to the mechanics of how it works, is long and steep. A major time commitment is required to fully understand the basics of futures and options. Once a clear understanding is obtained, producer's use and benefit economically from futures and options risk management. Past experience has shown that if participants do not have equity "at risk," they likely will lose interest or not devote the appropriate time required to learn risk management. The mechanics of futures and options and their implementation and use is identical, whether trading feeder or fat cattle contracts.
Lake Tahoe Environmental Education Coalition	$29,429.42	$30,606.60	$31,830.86	$33,104.10	$34,428.26	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 at Lake Tahoe about the relationship between our daily activities and the loss of the resources we all value. Most polls say that people want to protect their environment, but just don't know how. Unfortunately, current efforts at Lake Tahoe to achieve environmental education goals, though considerable, are often sporadic and disjointed. Though many agencies recognize this educational need, few if any have made it their top priority. As a result, current outreach efforts are often under-funded, uncoordinated, and only marginally effective.
Laughlin, NV Community Economic Development Educational Program	$23,546.60	$24,488.47	$25,468.01	$26,486.73	$27,546.20	Laughlin, NV and Bullhead City, AZ region is considered as one of the fastest growing rural regions in the nation. Sustaining growth in population and economic base is the primary goal for the region. To achieve this primary goal, community leaders from Laughlin, Bullhead City, and surrounding communities in the region, requested Cooperative Extension to provide leadership and technical assistance programming that provides education and training.

Title	2002	2003	2004	2005	2006	Statement of Progress
Livestock Grazing for Vegetation Management	$8,833.43	$9,186.77	$9,554.24	$9,936.41	$10,333.87	Over 250 people from 17 states and Canada attended a conference titled "Livestock Grazing for Vegetation Management" in Reno, NV on September 24-25. Speakers from both the scientific community and prescribed grazing practitioners discussed how prescribed grazing could be used to meet specific ecosystem management objectives.
Living on the Land: Stewardship for Small Acreages	$7,190.04	$7,477.64	$7,776.75	$8,087.82	$8,411.33	This project developed a curriculum and training for NRCS, Conservation District, and Extension personnel in eight western states who work with small acreage owners. The curriculum was based on key natural resource issues (goal setting, soil, water, plants and animals) and was reviewed by 17 professionals. Included are 15 PowerPoint lessons with lesson plans and evaluation tools, and an instructor's guide. Forty-seven professionals attended the training in October and learned how to use the curriculum to develop a comprehensive small acreage program. Over 800 copies of the curriculum have been distributed to date to 35 states and Australia.
Project MAGIC	$7,132.44	$7,417.74	$7,714.45	$8,023.03	$8,343.95	Several Nevada studies indicate that taxpayers support prevention programming. In a recent survey of rural counties in Nevada, 71 percent of the local population indicated support for increased spending for programs that might prevent juvenile crime. A recent statewide survey of all adjudicated youth in state-run juvenile detention facilities found that few alternatives to detention exist. Follow-up needs assessment surveys and a review of the relevant literature focused our program development activities. This resulted in the development of Project MAGIC under a CSREES State Strengthening grant awarded in 1996. Project MAGIC was originally designed for rural entry-level juvenile offenders and their families; under the current CSREES grant we have expanded to urban and Indian Reservation populations. Some communities also have begun accepting referrals from schools. These communities are using school referrals because of changes in the type and volume of offenders the probation officers are currently receiving from the courts. Due to the large numbers of offenders, some communities are only putting the highest risk youth on probation. Thus, school referrals provide the entry-level type youth that this program was originally designed for. Both the urban and Native American sites have adapted and modified the original curriculum and are in the progress of piloting those revisions. The Native American adaptation is centered on the cultural significance and customs associated with the concepts taught in the program. Because of the link between school failure and juvenile delinquency, several sites provide tutoring in addition to the 30-hour MAGIC curriculum. The parents of the juveniles participate in 12 hours of parenting classes.
Sustainable Biodiversity/Multiple use of Rangelands	$3,154.13	$3,280.30	$3,411.51	$3,547.97	$3,689.89	This sustainable biodiversity/multiple use of rangelands program emphasized a balance between wildlife habitat/diversity and livestock forage production, and proper functioning condition of riparian areas. A total of 695 people were taught during 19 instructional presentations to diverse audiences comprised of land users, resource professionals, Native American tribes, and youth. This program has become regional in scope; ten presentations on sagebrush ecosystem/sagebrush obligates were made in two California communities and two Oregon communities to groups interested in the grassroots approach for sagebrush ecosystem planning as related to the sage grouse issue. This program was nominated for the national Natural Resource Environmental Management (NREM) award.
Tahoe Basin Weed Coordinating Group	$4,314.03	$4,486.59	$4,666.05	$4,852.69	$5,046.80	The Tahoe Basin Weed Coordinating Group consists of landowners and managers, regulatory agencies and residents sharing information and resources to achieve effective weed control in the Lake Tahoe Basin.
Youth Agricultural Natural Resources	$676.94	$704.02	$732.18	$761.47	$791.93	The youth A/NR is composed of agriculture and natural resources classes, and three specific course areas: Soils, Range and Wildlife. While each course may stand alone, each does build on the previous learning. Knowledge of soil composition leads to an understanding of the flora and that prepares for a grasp of the sustainable fauna, both wild & domesticated. Each area includes an introductory 16-hour course and a following 40-hour basic course.
Water Conservation in Urban Landscapes	$3,983.56	$4,142.90	$4,308.61	$4,480.96	$4,660.20	The overall goal of this program is to teach different landscape options to residents and professionals that can reduce dependence on potable water for irrigation and still maintain high quality landscapes. This educational program closely parallels our research programs in plant water use and the use of poor quality water for irrigation.
Western Beef Resource Committee (Cow/Calf Handbook)	$3,184.35	$3,311.73	$3,444.20	$3,581.96	$3,725.24	The cow/calf handbook is the definitive beef cattle production handbook in the west. This committee meets once a year to update the book and add new information to it.

Appendix B

University of Nevada Cooperative Extension

Integrated Extension Activity

Title	2002	2003	2004	2005	2006	Statement of Progress
Age-paced Parenting Education	$4,146.69	$4,312.56	$4,485.06	$4,664.46	$4,851.04	Reaching parents just when they need information has proven to be an effective method for helping new parents understand their baby's development, nurture the new child, prevent child abuse, provide age-appropriate learning activities, and support the spousal relationship. Considerable work has gone on at the state and national levels with regard to age-paced parenting programs.
Alternative Crops/Native seed production	$3,748.48	$3,898.42	$4,054.36	$4,216.53	$4,385.19	Native seed production offers local agricultural growers a new crop that has the potential to use less water and increase farm income. Two experimental plantings were established in 2002. The first one failed due to a lack of irrigation water. The second trial is continuing with some replanting necessary during the fall of 2002. Production data will be available in 2003
Alternative Crops/Nursery stock trial	$2,498.99	$2,598.95	$2,702.90	$2,811.02	$2,923.46	Nevada is the fastest growing state in the nation and the most urban. There is a large demand for adapted nursery stock used by local homeowners, nurserymen, landscapers etc. in landscaping residential and commercial properties. The vast majority of nursery stock used in Nevada is imported from outside the state. This trial is investigating the potential to produce adapted nursery stock in Western Nevada thereby increasing the farm income of agricultural producers. The trial is expanding in 2003 with the addition of evergreen species.
Alternative Crops/Poplar tree production	$2,498.99	$2,598.95	$2,702.90	$2,811.02	$2,923.46	Poplar trees have the potential to add long term diversity to a producers farm income. This 4 year old project has demonstrated that survival and production of hybrid poplars in Churchill County is adequate for them to be considered as a viable alternative crop. The challenge is to develop markets for the trees in Nevada. The project is continuing with that goal in mind.
Alternative Crops/Premium wine grapes	$6,247.47	$6,497.37	$6,757.26	$7,027.55	$7,308.65	The need for alternative crops that consume less water and provide increased income to local agricultural producers resulted in a project testing premium wine grapes. The project currently is testing 14 varieties on 2 test vineyards in Churchill County. Survival and production information will not be available until 2003.
Alternative Crops/Seaberrry survival and production	$1,249.49	$1,299.47	$1,351.45	$1,405.51	$1,461.73	Seaberry is a crop widely grown in Europe and Asia. It is almost unknown in the United States but is extremely hardy and tolerant to soil salts. A new trial was established in Churchill and Nye Counties in 2002 with initial survival data slated to be collected in 2003.
Beef Cattle Management Informatics	$33,921.36	$35,278.21	$36,689.34	$38,156.92	$39,683.19	Information is the key to success in most businesses, and ranching is no exception. This program provides answers to ranchers or extension personnel on the beef cattle industry and/or information on how to find that information on your own using resource personnel, computers, computer programs, and the internet, both email (Extension Coffeeshop is an example) and sites.
Buckaroo Bunny's Reading Roundup	$3,317.35	$3,450.05	$3,588.05	$3,731.57	$3,880.83	Faculty finalized the curriculum plans for Buckaroo Bunny’s Reading Roundup. This workshop is the second in a series on literacy development in young children. Much of the planning took place in 2001.
Caring 4 Kids	$4,146.69	$4,312.56	$4,485.06	$4,664.46	$4,851.04	Work continued on two modules, “Nevada Child Care: Getting Started In Your New Profession “ (Swank) and “Child Abuse Recognition and Reporting” (with Reilly and Swank). With regard to the former, I helped Swank complete the videotape (with Channel 5) to be used in this introduction to childcare in Nevada. We also made progress with the second module. We updated the existing curriculum; revised sections to make them more relevant to child care providers, and previewed videotapes to accompany the module. I conducted an international search for new videotapes, since we failed to find any manufactured in the U.S. that precisely fit our needs.
Carson River Watershed Education Program	$8,041.17	$8,362.82	$8,697.33	$9,045.23	$9,407.03	The Carson River Coalition (CRC) continues to support a watershed awareness campaign. The coalition recognized the need for a program on protecting water quality, as new EPA regulations are imminent. The Coalition and the State of Nevada have supported the new Carson Valley Water Quality Education Program (CVWQEP). This committee wrote the first drafts of half of the text panels for our new Watershed map.

Title	2002	2003	2004	2005	2006	Statement of Progress
Cattlemen's Update	$3,392.14	$3,527.82	$3,668.93	$3,815.69	$3,968.32	A series of meetings held in the first week of January in the towns of Fallon, Ely, Elko, Winnemucca, and Gardnerville. These are meetings for ranchers on practical aspects of ranching. There are informational talks given on topics directly related to ranching, and are attended by 300-400 ranchers per year.
Child Care Nevada	$4,371.95	$4,546.83	$4,728.70	$4,917.85	$5,114.56	2002 was the 15th year of funding for the University of Nevada Cooperative Extension to develop, implement and evaluate child caregiver training for caregivers in Nevada. The curriculum developed in 2002 focused on literacy development for children, ages 3 to 8 years old.
COIN	$1,356.85	$1,411.13	$1,467.57	$1,526.28	$1,587.33	COIN is short for California, Oregon, Idaho, and Nevada and is an annual meeting as well as a subscribed email list of the Extension Specialists and Extension Educators in those states plus Utah for the purpose of sharing information on programs in each of those states. It is an invaluable resource for extension personnel in agriculture and natural resources.
Desert Bioscape	$8,206.00	$8,534.24	$8,875.61	$9,230.63	$9,599.85	Desert Bio-scape is a program that takes a holistic approach to the conservation of natural resources in the urban setting. The goal of this program is to teach homeowners and commercial clientele to conserve water and energy, reduce pesticide and chemical fertilizer use, and promote wildlife habitat in a sustainable manner. This program contains several components, including wildlife and conservation landscaping, constructed home wetlands for water recycling, a research project to find and determine water-efficient plants for the southern Nevada area, and a research project to determine the use and benefit of natural organic mulches in the Mojave Desert.
Domestic Water Quality and Health Concerns in Churchill County	$12,494.94	$12,994.73	$13,514.52	$14,055.10	$14,617.31	Residents in Churchill County have experienced a cancer cluster that many residents feel is related to excessive arsenic in the local drinking water supplies. This project is designed to determine residents exposure to arsenic from drinking water, the spatial and temporal distribution of arsenic in the drinking water, and to educate the residents about the level of exposure and treatment options. The program began in late 2002 and is continuing through September of 2005.
Family Storyteller	$4,146.69	$4,312.56	$4,485.06	$4,664.46	$4,851.04	UNCE staff conducted 6-week workshop series at 17 sites reaching 170 families (186 adults and 251 children). In addition, the collaborative team was contracted by the Nevada Literacy Coalition (see Scholarship, grants) to train volunteer workshop facilitators throughout the state. We conducted six one-day, six hour training sessions reaching 89 people, including librarians, teachers, school administrators, Even Start and Head Start personnel, child care providers, and other human service personnel. The training sites were Yerington, Caliente, Pahrump, Elko, Hadley, and Carson City. In turn, trained facilitators reaching 138 families conducted 17 additional series.
Family Storyteller ELL/Cuentos en Familia	$24,880.15	$25,875.36	$26,910.38	$27,986.79	$29,106.26	Research indicates that early language and literacy experiences are predictive of later academic success. Helping parents gain skills in reading with their preschool and young school age children has been associated with improved child outcomes. Children from low educational level families and for whom English is a second language are of particular concern due to a multiplicity of factors that place them at risk for school difficulties (Rossi & Stringfield, 1995). Given that the percentage of Spanish-speaking immigrants is expected to increase in Nevada over the next 25 years (Campbell, 1996), it is likely that ever larger numbers of English language learners, at risk for low achievement, will enter schools in our state. In both the Western and Southern Extension Areas, community agencies and Area Extension faculty asked for support in addressing the literacy needs of families for whom English is a Second language, keeping in mind social and cultural contexts. Increasingly, other programs and agencies are requesting training from Extension or inviting Extension to become a collaborative partner in addressing the literacy needs of families with young children.
Fiscal Issues and Rural Nevada – Nevada's Tax Structure and Impacts on Communities	$36,764.42	$38,235.00	$39,764.40	$41,354.98	$43,009.18	“Nevada’s Tax Structure and Impacts on Communities,” is a new program intended to reach and address the fiscal educational needs in Nevada. This integrated program is to begin developing a series of materials and tools that decision makers and citizens can use in increasing their understanding of the Nevada’s tax structure and how it impacts local counties.
Foster Youth Independent Living	$16,657.83	$17,324.14	$18,017.11	$18,737.79	$19,487.30	This program teaches life skills to foster youth who are preparing to leave foster care due to attaining the age of majority. Program staff assist youth in developing a transitional living plan that allows them to successfully transition to an independent living status.
Healthy Child Care Nevada	$4,146.69	$4,312.56	$4,485.06	$4,664.46	$4,851.04	There are three major thrusts associated with this grant-funded program: establishing a Child Care Health Consultation network in Nevada, a study of the National Health and Safety Performance Standards compared with the Nevada Child Care Licensing Regulations, and enrolling children in the Children’s Health Insurance Program through child care providers.

Title	2002	2003	2004	2005	2006	Statement of Progress
Home Visitation, Parenting Classes, and Computerized Delivery systems	$4,146.69	$4,312.56	$4,485.06	$4,664.46	$4,851.04	I continued to work on the evaluation of Clark County's home visitation program, the further development of Project MAGIC, and the development of video games to enhance parenting education and parent-child communication.
Invasive Weed Management	$2,498.99	$2,598.95	$2,702.90	$2,811.02	$2,923.46	Invasive plant species continue to increase in Nevada. This program is aimed at increasing the awareness of Nevada citizens about the damage caused by invasive weeds and to provide enough information to will allow the citizens to take positive control actions.
Invasive Weed Management	$54,292.29	$56,463.98	$58,722.54	$61,071.44	$63,514.30	Invasive plant species continue to increase in Nevada. This program is aimed at increasing the awareness of Nevada citizens about the damage caused by invasive weeds and to provide enough information to will allow the citizens to take positive control actions.
Laughlin, NV Community Economic Development Educational Program	$25,735.10	$26,764.50	$27,835.08	$28,948.49	$30,106.43	Laughlin, NV and Bullhead City, AZ region is considered as one of the fastest growing rural regions in the nation. Sustaining growth in population and economic base is the primary goal for the region. To achieve this primary goal, community leaders from Laughlin, Bullhead City, and surrounding communities in the region, requested Cooperative Extension to provide leadership and technical assistance programming that provides education and training.
Nevada Kids Count Data Book	$4,146.69	$4,312.56	$4,485.06	$4,664.46	$4,851.04	The Nevada Kids Count Data book provides information about child well-being in Nevada that can be compared across counties within the state as well as with data from other states across the nation.
Parenting From Prison	$8,743.90	$9,093.65	$9,457.40	$9,835.70	$10,229.12	Parenting From Prison is a parenting class offered at the Silver Springs Conservation Camp, minimum security prison for women and at the Nevada State Prison, medium security prison for men in Carson City. Participants are inmates who expect to be reunited with their children or children of another person upon release. The class focuses on ways to maintain or strengthen relationships, by learning parenting and communication skills, as well as learning developmental norms and age-appropriate guidance methods.
Parenting Issues at Ridge House	$8,743.90	$9,093.65	$9,457.40	$9,835.70	$10,229.12	Ridge House is a transitional shelter for recently incarcerated men and women with substance abuse issues. Residents of Ridge House participate in numerous classes during their 3 month stay. Parenting Issues is a weekly 90 minute class that meets for 6 weeks for all parents. Parenting Issues focuses on typical development and guidance, impact of parental incarceration on children, as well as reconciliation issues.
Parent/Nutrition Education Programs	$4,146.69	$4,312.56	$4,485.06	$4,664.46	$4,851.04	I continue to work closely with health and nutrition faculty members on programs that affect children's health and nutrition through parenting education.
Project MAGIC	$72,936.71	$75,854.18	$78,888.35	$82,043.88	$85,325.64	Several Nevada studies indicate that taxpayers support prevention programming. In a recent survey of rural counties in Nevada, 71 percent of the local population indicated support for increased spending for programs that might prevent juvenile crime. A recent statewide survey of all adjudicated youth in state-run juvenile detention facilities found that few alternatives to detention exist. Follow-up needs assessment surveys and a review of the relevant literature focused our program development activities. This resulted in the development of Project MAGIC under a CSREES State Strengthening grant awarded in 1996. Project MAGIC was originally designed for rural entry-level juvenile offenders and their families; under the current CSREES grant we have expanded to urban and Indian Reservation populations. Some communities also have begun accepting referrals from schools. These communities are using school referrals because of changes in the type and volume of offenders the probation officers are currently receiving from the courts. Due to the large numbers of offenders, some communities are only putting the highest risk youth on probation. Thus, school referrals provide the entry-level type youth that this program was originally designed for. Both the urban and Native American sites have adapted and modified the original curriculum and are in the progress of piloting those revisions. The Native American adaptation is centered on the cultural significance and customs associated with the concepts taught in the program. Because of the link between school failure and juvenile delinquency, several sites provide tutoring in addition to the 30-hour MAGIC curriculum. The parents of the juveniles participate in 12 hours of parenting classes.

Title	2002	2003	2004	2005	2006	Statement of Progress
Restoring Rangeland Health	$6,894.58	$7,170.36	$7,457.17	$7,755.46	$8,065.68	My rangeland health program focused on noxious weed management and revegetation. A total of 190 adults and 530 youth were taught about weed management via slide presentations, field tours, demonstration projects, and hands-on activities. A local weed action group, the Spring Creek Weed Action Team (SWAT), formed as a result of weed educational efforts, and has become self-sustaining, continually increasing its weed education and control activities. I also helped develop and facilitate a 5-day workshop on Restoration and Management of Sagebrush/Grass Communities, attended by 290 participants from 11 western states. My weed education activities contributed 18 CEUs for licensed pesticide applicators, and the sagebrush workshop was worth 16 CEUs for certified professionals in rangeland management.
Sustainable Biodiversity/Multiple use of Rangelands	$10,341.86	$10,755.54	$11,185.76	$11,633.19	$12,098.52	My sustainable biodiversity/multiple use of rangelands program emphasized a balance between wildlife habitat/diversity and livestock forage production, and proper functioning condition of riparian areas. A total of 695 people were taught during 19 instructional presentations to diverse audiences comprised of land users, resource professionals, Native American tribes, and youth. This program has become regional in scope; ten of my presentations on sagebrush ecosystem/sagebrush obligates were made (by request) in 2 California communities and 2 Oregon communities to groups interested in the grassroots approach for sagebrush ecosystem planning as related to the sage grouse issue. My peers nominated this program for the national Natural Resource Environmental Management (NREM) award.
Wastewater Management	$31,122.76	$32,367.67	$33,662.38	$35,008.88	$36,409.23	A seven week course in the management of reuse water in urban agriculture is offered to water management personnel (golf courses, parks, schools, hotels, landscapers). Material covered includes health issues, regulations, cost/benefits and best management practices to implement.
Western Beef Resource Committee (Cow/Calf Handbook)	$3,392.14	$3,527.82	$3,668.93	$3,815.69	$3,968.32	The cow/calf handbook is the definitive beef cattle production handbook in the west. This committee meets once a year to update the book and add new information to it.
Wildfire Fuels Management/Post Fire Rehabilitation	$6,247.47	$6,497.37	$6,757.26	$7,027.55	$7,308.65	This project is using intensively managed livestock grazing as a tool to reduce wildfire fuels, and improve post fire seeding success. After 3 years of study the study results indicate that livestock can significantly reduce annual plant populations, but that grazing did not increase seeding success.
Youth Agricultural Natural Resources	$44,391.60	$46,167.27	$48,013.95	$49,934.51	$51,931.89	The youth A/NR is composed of agriculture and natural resources classes, and three specific course areas: Soils, Range and Wildlife. While each course may stand alone, each does build on the previous learning. Knowledge of soil composition leads to an understanding of the flora and that prepares for a grasp of the sustainable fauna, both wild & domesticated. Each area includes an introductory 16-hour course and a following 40-hour basic course. The reactive adult A/NR program primarily addressed horticulture and pest control issues through classes, material dissemination, newsletters, phone and personal contact.

U.S. Department of Agriculture

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

APPENDIX C

Institution Nevada Agricultural Experiment Station

State Nevada

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

	Actual Expenditures				
Title of Planned Program/Activity	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
See Attached Schedule					
Total					

David G. Thawley
Director

02/28/03
Date

Form CSREES-REPT (2/02)

NEVADA AGRICULTURAL EXPERIMENT STATION
ATTACHMENT TO FORM CSREES-PLAN (2/02)
INTEGRATED ACTIVITES (HATCH ACT FUNDS)

TITLE OF PLANNED PROGRAM/ACTIVITY	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
Freeze damage and protection of horticultural species	8,239	17,438			
Genomics studies in plants, insects, infectious pathogens and vertebrates	132,571	204,211			
Perpetrators and victims: delineating resiliency associted with peer-related adolescent violence	13,874				
Improving quality of child care in Nevada	16,224				
Understanding and enhancing intergenerational literacy in ESL families	19,090	28,496	21,372		
Adolescent suicide risk and peer related violent behaviors	5,121	32,474	32,474	24,356	
Improving quality of child care in Nevada: continued explorations	8,400	30,409	22,807		
Use of school environment to reduce obersity risk among middle school students in Nevada	14,410				
Modifying milk fat consumption for enhanced manufacturing qualities and consumer acceptibility		47,050			
Statewide survey of elementary school employees	17,712	17,971	17,971	13,478	
Rural communities and public lands in the West		16,395			
Strategic development of a competitive grape industry in Nevada	8,773	68,831	68,831	51,623	
Identification of location factors for biotechnology firms		67,793	67,793	50,845	
Sediment trapping and channel changes by post-drought riparian vegetation	18,489				
Modeling the effects of environmental stresses on oocysts	26,636	15,286			
Field scale utilization of the shallow saline aquifer in Clark County	17,570				
Reproductive performance in domestic ruminants		37,809	37,809	28,357	
Vegetation management along a riparian corridor	10,325	34,428	34,428	25,821	
Rural communities and public lands in the West:Impacts and alternatives	11,396				
Improving nitrogen utilization in alfalfa hay by ruminants	29,204	8,955			
Modifying milk fat consumption for enhanced manufacturing qualities		18,405			
Additional projects to be approved in years 2003-2006				5,546	200,026
TOTALS	358,034	645,951	303,485	200,026	200,026