



**UNIVERSITY OF ARIZONA**  
**COLLEGE OF AGRICULTURE AND LIFE SCIENCES**

**AGRICULTURAL EXPERIMENT STATION**  
**&**  
**COOPERATIVE EXTENSION**

**Annual Report of Accomplishments and Results**

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## PROGRAMS

### Overview :

Research and Extension programs are integrated in the scholarship of discovery, integration and application at the University of Arizona. Extension Specialists carry a joint Research appointment and many Research Specialists carry a joint Extension appointment. In addition, where appropriate in our distributed educational system, many of our joint Extension/Research faculty have a formal teaching appointment. Our approach is to provide an integrated and multi-functional approach as we address the diversity of needs across the State of Arizona. We provide these select impacts as they reflect unique benefits to a diversity of clientele and stakeholders. Finally we provide our own assessment of accomplishments based on the 5-year Plan of Work for the appropriate report period.

### Goal 1: *An agricultural system that is highly competitive in the global economy*

#### Arizona Meteorological Network (AZMET)

##### Issue

The Arizona Meteorological Network (AZMET) was developed in 1987 to provide weather data and information in near real time to the state's producers of agricultural and horticultural crops. Properly tailored weather information can assist with important management decisions related to variety selection, planting dates, crop assessment, pest control, irrigation and harvest.

##### What has been done?

A network of 23 automated weather stations was established in southern and central Arizona to supply meteorological data from important agricultural production areas and selected urban locations. Meteorological data obtained by the stations are transferred to a Tucson-based data processing center each night where computers process the data into a variety of informational formats. AZMET data and reports are made available to the public free of charge via two Internet Web pages.

##### Impact

AZMET is now widely accepted as an important (and often the only) source of meteorological information pertaining to the production of agricultural and horticultural crops in Arizona. Use of AZMET information continues at a high rate; users accessed AZMET Web pages in excess of 90,000 times in 2002.

Crop Production: Perhaps the most important impact of AZMET in production agriculture has been its ability to provide reliable information on heat units which are used to 1) time planting and harvest dates of horticultural crops such as melons and sweet corn; 2) predict pest development; and 3) monitor general crop development. AZMET plays an integral role in the success of the Arizona Cotton Advisory Program by providing weekly updates on heat unit accumulation, crop water use, and current and projected weather condition. AZMET also provides daily updates on the potential

for heat stress, which can significantly reduce fruit retention and yield of cotton.

**Water Use/Irrigation Management:** AZMET provides data on evapotranspiration (ET) which can be used to estimate the water use of vegetation. During 2003 the tribal farm of the Ft. Mohave Indian Reservation began using AZMET ET to schedule irrigations on more than 6,000 acres of cotton and alfalfa. AZMET generates daily turf water use reports for the Phoenix area and distributes this information to the public via a turf water management web page, email and automated fax transfer system. Sixteen large turf facilities ( with more than 10 acres in turf; mostly golf courses and parks) receive this information via email or fax daily. The turf web page was accessed in excess of 5300 times in 2002. AZMET also generates a lawn watering guide which is published daily in major newspapers in the Phoenix metropolitan area.

**Consulting:** AZMET information is also widely used by the consulting community for production agriculture, environmental impact assessments, insurance claims, legal disputes and water rights adjudication.

## **Funding**

Smith-Lever Funds

Arizona Cotton Research and Protection Council

Arizona Grain Research & Promotion Council

Arizona Department of Water Resources

City of Phoenix

Station sponsors: irrigation districts, NRCs, power districts, commodity organizations, etc.

## **Nitrogen Management in Irrigated Cotton**

### **Issue**

The traditional approach to nitrogen management in irrigated cotton has been to push for maximum high yields by applying large amounts of nitrogen fertilizer. Historically, in many parts of Arizona, nitrogen application rates have exceeded 200 pounds per acre per season. Although yields may increase, there are serious drawbacks to this practice. Over the last 10-15 years the luxuriant vegetative growth resulting from these high nitrogen applications has harbored damaging insect populations and diseases in Arizona's cotton fields. Studies during the same period have shown that aggressive nitrogen fertilizer application can actually increase the loss of nitrogen from the soil. In the past, nitrogen fertilizer has been relatively inexpensive for Southwest desert growers, but early in 2001 those costs rose approximately 30 percent, where they remained throughout 2002.

### **What has been done?**

To help Arizona cotton growers reduce their reliance on high nitrogen applications in their fields, University of Arizona researchers studied and documented nitrogen uptake patterns and requirements in the crop. UA College of Agriculture and Life Sciences researchers then designed nitrogen management guidelines and recommendations that pinpointed the best times to apply nitrogen in the proper amounts. Over the last 13 years this comprehensive nitrogen management strategy has been implemented in a statewide extension education plan for cotton growers that

includes bulletins, reports, articles and grower meetings.

### **Impact**

The cost of cotton production has been high during the last several years, but the market price has been low. UA demonstration projects on cooperating cotton farms have realized yields equivalent to commercial yields, using less nitrogen input, which has saved approximately \$30 per acre in nitrogen application costs. If adopted statewide, the annual savings, at February 2002 nitrogen prices, would be about \$15-\$20 per acre. If 200,000 acres of the total cotton acreage in Arizona were affected, this would equate to \$3 to \$4 million in savings to the growers. Growers would be using approximately 150 pounds per acre, compared to a more common rate of about 200 pounds per acre, a 25 percent reduction. In 200,000 acres of cotton, this means 5,000,000 pounds of nitrogen fertilizer would be withheld, resulting in less rampant vegetative growth, fewer insect problems and improved plant use of residual nitrogen in the soil. It would also protect groundwater from excess leaching of nitrogen compounds, thereby protecting the environment.

Difficult market conditions, which are the worst they've been since the Great Depression, have no doubt served as a stimulus in encouraging growers to make these changes. Approximately 60 percent of the cotton growers in Arizona are using more conservative nitrogen management strategies than they were five to ten years ago. Fortunately, the information in the educational program associated with these management decisions was already in place.

### **Funding**

Water Quality Program, national Cooperative Extension

Hatch Act

Smith-Lever

Arizona Cotton Growers Association; Cotton Incorporated

### **Cancer Compounds in Desert Plants**

#### **Issue**

Scientists at the Office of Arid Lands Studies' Southwestern Center for Natural Products Research and Commercialization (SCNPRC) in the University of Arizona's College of Agriculture and Life Sciences are working with other universities, with pharmaceutical companies and with other commercial entities to develop new biological and industrial products. The ultimate goal of this collaborative research program is to locate specialty chemicals in indigenous desert plants that can be grown as industrial cash crop and microorganisms that can be used to produce pharmaceuticals. Substances active against cancer are in particular demand.

#### **What has been done?**

The SCNPRC team selects plants, evaluates them chemically, tests products, performs biological assays, and determines how to grow and process plants on a commercial scale. In plants, active compounds may be located in the roots, shoots, leaves, flowers or seeds, and in microorganisms these may be intracellular or extracellular. In the case of pharmaceutically active ingredients, those showing particular promise will progress into preclinical, then clinical testing for efficacy. In 1999, after examining several thousand desert plant species over the past seven years, a natural products

scientist and his team found two substances so promising for pharmaceutical use that the original patents were formally revised and submitted as full patents for both U.S. and international coverage. One has topical activity against skin cancer and is now demonstrating other potential pharmaceutical uses. This collaborative group is now studying the impact of the other compound on the current testing model for new anti-cancer drugs. They are also pursuing other plant- and microorganism-derived leads, including several more that are in the pipeline for in vivo testing.

### **Impact**

The material that has been pursued the most extensively over the past year resulted in a new patent filed in May 1999 and an international patent filed in October 1999. This research has been pursued as a collaborative and multi-institutional project that ultimately could have a significant impact on the treatment and prevention of topical tumors, as well as other biological uses. Two compounds isolated from Sonoran desert microorganisms are currently undergoing animal studies. This is part of an ongoing effort to find unique applications from desert plants with development at the same time to allow for conservation and maintenance of the delicate desert ecosystem.

### **Funding**

Arizona Agricultural Experiment Station–Natural Products Center

Arizona Disease Control Research Commission

Public Health Funding from NIH and NCI

Department of Defense Prostate Cancer Program

American Institute for Cancer Research

### **Cotton IPM: Reducing Insecticide Use**

#### **Issue**

Insecticide applications in cotton typically account for about half of all insecticide use in the United States. New materials on the market are now enabling cotton growers to reduce their spray applications while maintaining competitive yields. These technologies also help growers implement more ecologically-based IPM programs and become less dependent on broadly toxic insecticides.

#### **What has been done?**

An integrated pest management program in Arizona implemented two new tools in 1996 and continued their use through 2002: insect growth regulators (IGRs, effective against whiteflies) and transgenic cotton (containing Bt effective against pink bollworms). The University of Arizona College of Agriculture and Life Sciences collaborated with growers, the USDA, the Arizona Department of Agriculture, the Arizona Cotton Growers' Association, Cotton Incorporated, industry and others. Both of these tools are highly effective against pests, but safe to humans and the environment. Based on insect hormones, growth regulators disrupt the growth and development of insects. Transgenic cotton is genetically engineered to carry its own

biological insecticide, targeting lepidopterous pests, within the plant tissues.

## **Impact**

Nearly 100 percent of the cotton acreage in Arizona was sprayed multiple times for pink bollworm and silverleaf whitefly in 1995; however, from 1999 through 2001 the majority of acres were never sprayed even once for these two pests. Comparing averages for 1990-1995, a period before the IPM education and technologies were introduced in cotton production, with averages for 1996-2002, the following reductions in spray applications were realized:

For silverleaf whitefly, the average number of chemical sprays dropped from 3.58 sprays per season in 1990-1995 to 1.15 in 1996-2002, representing a 68 percent reduction and over \$72.4 million in cumulative control savings, or about \$10 million annually. For pink bollworm, the average number of sprays per season decreased from 2.72 sprays per season to 0.72 sprays, a 74 percent reduction, representing \$39 million in cumulative savings. For Lygus bug, sprays have decreased only slightly, from 1.57 sprays to 1.52 sprays, a 3 percent decrease; however, due to inflation and other increases in costs of insecticides, there has been a \$24.3 million increase in cumulative control costs. Yet the total for all three pests, and other minor pests, reduced from 9.03 sprays to 3.84 sprays, or a 58 percent reduction overall and a cumulative control savings of \$103.2 million over the seven-year period of 1996-2002. Annual cotton acreage in Arizona is usually over 250,000 acres.

Along with resistance management, these IPM efforts reduced insecticide use, conserved biological control agents, and enhanced sustainability and profitability. The availability of these selected technologies, which are harmless to predaceous insects, has provided growers the opportunity to employ IPM practices that enhance the population levels of beneficial insects in the field and created area-wide benefits for all producers. Furthermore, these plans have been exported for use in California, northern Mexico, and Australia.

## **Funding**

Hatch Act

Smith-Lever 3(b) & (c)

Special Research Grants Smith-Lever 3(d) (e.g., IPM)

Other CSREES: Western Region IPM; Pest Management Alternatives Program)

Commodity: Cotton Incorporated

State: Arizona Cotton Growers Association

Other Industry: Agrochemical

## **Corn Gene Identification Project**

### **Issue**

Cereal crops are the staple of most human diets worldwide. To improve crop yield and improve nutritive features in cereal crops, plant breeders need to know more about how specific genes work. Until recently, no one has ever attempted to characterize all of the genes in a single cereal crop.

### **What has been done?**

In 1998 plant scientists from the UA and five other universities won a 5-year, \$12 million grant from the NSF to discover all 50,000 genes in corn, the nation's most important economic crop.

The scientists are using a new method for discovering and sequencing genes in corn, and are sharing project findings and material resources with public and private researchers working to develop improved traits in corn and many other agronomically important grasses, such as wheat, barley, rice and oats. Additional tools developed by this project will enable scientists to learn where and when each gene is active and how the gene functions. The corn genomics project is expected to lead to greater fundamental genetic understanding of cereals that worldwide contribute roughly 70 percent of the calories in the human diet.

### **Impact**

University of Arizona molecular geneticists have prepared slides containing about 25,000 corn genes, which are being used in over 80 research laboratories to examine gene expression in maize. As the sequence of each targeted gene is characterized, researchers have entered this information into a computer database where plant breeders, plant genetic engineers and researchers in basic biology around the world are accessing this information so they can use these genes to learn more about how plants work. Slides, gene libraries and seed containing the mutated genes are available to the scientific community. The project is already having major benefits for plant research around the world, according to the researchers. Several thousand people are requesting these genes, and other resources.

### **Funding**

Hatch Act

National Science Foundation (NSF)

## **Aquaculture Pathology Program for Shrimp**

## **Issue**

Large scale commercial farming of shrimp is a young and rapidly growing industry that began only 30 years ago, and now nearly half of the world supply comes from farms. Most of the product is imported by the U.S., Japan and Western Europe. As the industry has grown, some very significant shrimp diseases have emerged and have also become more widespread in the industry, resulting in some severe epizootics in some shrimp growing countries, and in global crop losses since 1992 averaging nearly one billion dollars annually.

## **What has been done?**

The Aquaculture Pathology Program in the University of Arizona College of Agriculture and Life Sciences focuses on diagnosing and researching shrimp diseases. The main goal is to describe and study the biology of diseases of farm-raised shrimp and to develop diagnostic methods and control or prevention strategies for these diseases using traditional and modern molecular techniques.

Once an accurate diagnostic method is developed, prevention and control methods are researched as well. These include methods for developing specific pathogen-free or specific pathogen-resistant shrimp stocks.

The program includes a laboratory and a primary quarantine facility which acquires wild or farmed shrimp and assesses the disease status of these stocks. The laboratory has been designated by the Office of International Epizootics as one of only two reference laboratories in the world for crustacean pathogens, and it was recently received USDA APHIS certification for shrimp disease diagnostic services. The ideal geographic location of the UA, isolated from coastal waters, reduces to near zero the risk of accidental introduction of shrimp pathogens into the aquatic environment.

The UA provides expert assistance to governments and to the shrimp farming industry with a variety of diagnostic techniques, including microbiological and histological identification of the disease process, electron microscopic examination of newly recognized shrimp pathogens, as well as other standard diagnostic methods. The UA has also pioneered the use of molecular and monoclonal antibody technologies for application in the study and diagnosis of shrimp diseases and it has received USDA APHIS certification for shrimp disease diagnostic services. .

## **Impact**

Diagnostic kits based on gene probes and monoclonal antibodies have been developed by the Aquaculture Pathology Program and transferred to the private sector for commercial development and marketing. These kits can be used in diagnostic laboratories and in the field at shrimp farms and hatcheries. The kits provide the shrimp farming industry much more rapid and sensitive tools for detecting pathogens than were available with traditional methods like histology and live animal bioassays. Currently, 75% of the approximately 40 shrimp disease



diagnostic laboratories present in the Western Hemisphere use kits that were initially developed at the University of Arizona. While the financial impact of these advanced diagnostic technologies to the shrimp farming industry of the Americas cannot be readily measured, their widespread use by the industry highlights their importance in disease management.

## **Funding**

Special Research Grants

Other CSREES: USDA Marine Shrimp Culture Consortium

Environmental Protection Agency; U.S. Department of Commerce (grants and contracts); NSF; Food and Agriculture Organization of the U.N.

## **Direct Farm Marketing & Tourism Activities to Keep the Farm**

### **Issue:**

The value-added contribution by U.S. producers of consumer food expenditures has fallen from 22.8% in 1950 to only 7.9% in 1999. Global competition and modern production technologies have pushed the price of raw agricultural commodities downward so that many farmers and ranchers have found it difficult to remain in production agriculture. This is particularly true for farmers with land holdings next to urban centers where development potential exists. However, some farmers and ranchers have mastered the art of obtaining a higher profit margin from their agricultural land holdings by marketing food products and farm recreation directly to the consumer.

### **What has been done?**

Two UA College of Agriculture and Life Sciences faculty put together the first annual Arizona Direct Farm Marketing and Tourism (DFMT) conference in 1995 at the same time they finished putting together a 250-page layman's publication on the topic. The educational curriculum was designed to provide producers with an A-Z publication for finding the essentials needed to start and develop a direct farm marketing enterprise. Producers have been able to network and learn from each other at the annual conference by sharing their failures and success stories. The 8<sup>th</sup> annual conference was held at Young's Farm in Dewey, AZ in 2002. It draws both regular and new participants who are investigating whether they should try direct farm marketing. Generally 50 to 100 individuals attend the annual conference and the Handbook curriculum has reached thousands of people. Requests to utilize the Handbook for a short course or class have come from other Western states, and Australia, Canada, South Africa.

An interim board was recently formed to organize an Arizona Farmers' Direct Marketing Association. Issues the association will address include being a collective voice in the state for direct farm marketing issues, educational programs, collective buying of insurance products for

members, coordinating better with Arizona Grown, developing a farmers' market directory, and creating an association web site.

## **Impact**

Participants at the direct farm marketing conference (DFMT) in 2002 not only rated the topics presented as being relevant to their operation but indicated that they thought there was a high probability (3.2 on a 4.0 scale) that they would incorporate the information learned at the conference into their business operations. One hundred percent of the respondents said the conference enhanced their knowledge of the topics presented, and 100 percent said they would share the information they learned in the following ways: with another colleague (75 percent); with family (57 percent); with friends (46 percent); with community leaders (46 percent); with educators (32 percent) and with others (11 percent). One participant is networking with others who attended the conference to develop an organic farming enterprise that will include a restaurant and grass-fed beef program.

The DFMT Handbook is still widely accessed and maintains the #1 listing for "Direct Farm Marketing" on the Google search engine (rank is based on web sites selected by users).

"I actually used the information from your website to begin looking into marketing my eggs! I must have used a ream of paper and 2 ink cartridges printing it off. I found the section on business planning extremely helpful." –participant

## **Funding**

Hatch Act

Smith-Lever Funds

## **Computer Software Tools to Enhance Ranch Profitability**

### **Issue**

The ranching business is by nature multifaceted, with expertise required in three main management areas: range, financial, and livestock production. The success of each ranching enterprise is dependent upon the operator's skills in each of these areas. Given that many ranchers are in the ranching business because they treasure the lifestyle, financial management can often be neglected. Yet it is the area where the rancher can define the strengths and weaknesses of the operation to ensure the ranch will still be in the family for the next generation. Drought, low prices and having fewer pounds of beef to sell all make it critical for Arizona ranchers to understand and analyze their finances with greater precision. In addition, last year's drought was the first time many Arizona ranchers were forced to remove all their cattle from

public lands. This forced liquidation and uncertainty regarding restocking has caused several ranchers to reevaluate whether they should get back into the ranching business.

### **What has been done?**

Cooperative Extension addresses ranch financial management by providing hands-on workshops. Three UA faculty have developed diagnostic software tools that pinpoint problems for ranch profitability and assist in record keeping, cash flow analysis, drought mitigation options, retained ownership, and evaluating the decision to restock the ranch after the animals have been removed. Data used for the computer workshops is based on actual figures from the University of Arizona's V Bar V ranch. The ranch restocking software evaluates the costs and returns associated with variations in buying replacements or waiting for replacements to come from within the herd over time.

Today's computers and software provide relatively easy tools for recording and analyzing ranch management decisions. With appropriate inputs, the computer can numerically and visually evaluate how business decisions have the potential to threaten or enhance the financial health of an operation. However, using computers can be a barrier to those who have never had the opportunity to learn how. Each software tool has been designed and written with rancher input to make it user-friendly and relevant for Arizona ranchers. Training is conducted using a portable 20-machine wireless computer laboratory. This mobile lab environment allows faculty to reach underserved communities that normally do not have access to computer facilities. Over the past two years, 16 workshops have been held, with plans underway to expand the program to increase outreach to remote communities where little, if any, hands-on ranch management training has occurred.

### **Impact**

During 2001-2002, the Planning for Profitability curriculum, diagnostic financial spreadsheet and restocking decision tool have been taught to 341 ranchers and agribusiness professionals—approximately 80 percent of the industry based on total market sales—throughout Arizona and Utah. According to exit interviews collected after several of the workshops, 89 percent of the participants interviewed stated that the way they keep records would change as a result of the workshop; 83 percent reported that the workshop would influence their management practices, and 63 percent reported an increase in their understanding of ranch financial management.

“It gave me a better understanding of how and why we need to do a proposed budget for better management.” –workshop participant

“Will follow expenses more closely. The workshop helped show how and what.” –participant

“More effective way to see possible alternative methods and what is influencing our ranch.”  
–participant

### **Funding**

Smith-Lever Funds

USDA: RMA

The Western Center for Risk Management Education

## ***Goal 2: A safe and secure food and fiber system***

### **Arizona's Statewide Food Safety Program**

#### **Issue**

Foodborne illness and death continue to occur in Arizona. The Arizona Department of Health Services reported more than 2039 cases in 2000. The Centers for Disease Control estimate that only 10 percent of all cases are even reported. The 2000 FDA report on food safety stated that between 6.5 and 8.1 million cases of foodborne illness and as many as 5000 related deaths occur each year in the United States. Experts believe that the risk of foodborne illness is increasing due to changes in the food supply system; an increase in group feeding; an increase in the number of people at greatest risk of foodborne illness--elderly, children and people with suppressed immune systems; changes in pathogens and new resistant strains; and new modes of transmission of pathogens. An interdisciplinary, research-based approach to education is needed on the issues affecting the safety and quality of the food supply from the farm to the table.

#### **What has been done?**

Safe Food 2010 is a multi-year project focusing on education in food safety with the general public, school food service staffs, group home staffs, food banks and other community groups. The ultimate goal is to reduce foodborne illness in Arizona and to increase safe food handling practices, from the field to the consumer's plate. The program uses a broad array of both written information and workshops delivered in several counties in Arizona. Workshops include Master Consumer Adviser volunteer training, food safety education classes, EFNEP (Extension Food and Nutrition Education Program) classes, Safe Food Handling for the Occasional Quantity Cook, and a biennial Food Safety from the Farm to the Table Conference. Information services include 800-number food safety hotlines, weekly news columns on food safety in a Phoenix area newspaper, and Safe Food Weeks, when food safety information packets are delivered to print and broadcast media for dissemination to the public.

#### **Impact**

More than 2000 low income families annually have attended EFNEP classes in Arizona. Of these, 93% have made positive changes in their food behaviors, and 52% improved safe food practices, according to follow-up surveys. Safe food practices result in reduced medical costs and fewer lost work days. Similar results occurred with school and institutional food service staffs. In a six-month follow-up survey with participants, 95% reported improvement in at least

one safe food practice due to the training, with a 30% increase in safe food practices. These changes affected more than 200,000 children or at-risk adults. As the program spreads, the total potential number of elementary students affected by food lunch practices in Arizona would be more than 562,000 children. Food service personnel are constantly changing, so ongoing education is critical. Extension volunteers and staff have trained more than 300 community quantity cooks in safety practices. Participants report adding new safe practices to their quantity meals with church members, fund-raising dinners and homeless outreach. Reported cases of foodborne illness in Arizona declined from 5200 in 1995 to 2039 in 2000.

Conference feedback: 150 Safe Food 2002 conference participants rated the conference general and concurrent sessions 4.5 out of 5 as high. Twenty-six people who had attended in 2001 reported they had shared the information with 5400 additional people. Survey data from previous Safe Food Conferences showed that 84 percent had used the Safe food 2000 conference information and materials at work or home; 84 percent said the conference helped them update their current job skills; 72 percent had shared information with co-workers and 46 percent shared information with people they taught or trained.

## **Funding**

University of Arizona Cooperative Extension

Staff time: Maricopa, La Paz and Yavapai County Department of Environmental Health,  
Arizona Department of Health Services Arizona Department of Agriculture

USDA-CSREES,

Industry supporters

Staff time: Food banks, restaurant industry, Intertribal Council, local grocery representatives,  
Arizona Beef Council, Arizona Gleaning, parish ministry and social service organizations

## **Food Safety Education Program**

### **Issue**

Increased outbreaks of foodborne illness have raised consumer concern about food safety related to purchasing food, eating at restaurants, and food preparation and storage in the home. In 1999 alone, the top five foodborne diseases in Arizona totaled 1,986 cases, including 33 cases of

E. coli 0157:H7. With the high turnover in food service employees, ongoing food safety education and training is needed. A large percentage of these employees speak only Spanish, creating the need for food handler certification training and food safety education in Spanish. In Yavapai

County, Arizona, the new county health code requires that at least one manager per food establishment have manager certification in food safety. In partnership with the county environmental health department, the UA Cooperative Extension in Yavapai County identified food safety education program needs through a food safety industry council appointed by the Board of Supervisor's representing industry, regulatory, academia, and consumers.

### **What has been done?**

In 2002, the Food Safety Education Program offered through the Yavapai County Cooperative Extension served 1,709 residents. The program featured educational programs for small retail food managers, employees, and consumers to address the needs of food safety education from the farm to the table. Participants obtained research-based food safety information and education through one-to-one contacts, telephone, Internet, publications, a quarterly food safety newsletter (900 distribution) and community seminars. Manager Certification Training was offered monthly serving 201 restaurant managers; managers also had the opportunity to participate in research-based seminar food safety updates; 388 employees participated in food safety employee bilingual workshops. Fight BAC (fight bacteria) education seminars were held for 320 consumers, and 2000 Fight BAC brochures were distributed in the community. Extension addressed 226 public service calls related to food safety.

### **Impact**

The partnership between the University of Arizona Cooperative Extension Yavapai County and the Environmental Health Department has resulted in the County Board of Supervisors' approval of 1.0 FTE to support the third year of this program in the amount of \$38,000 annually. Food service managers and employees have increased their knowledge, skills and application of food safety principles in the work environment to "Make Yavapai County a Safer Place to Eat". Pre/Post test evaluations continue to result in high ratings, on a scale of 1 to 5 (low to high) mean ratings were 4.8. As a result of education efforts, a more knowledgeable workforce is applying safe food practices. Consumers increased their awareness of potential food hazards and actions they can take to improve food safety in the home according to post survey mean ratings of 4.5 on a scale of 1 to 5, (low to high). One consumer said, " I always wash my cutting board with soapy water but no one ever told me about the need to sanitize! I also now know how to keep my food out of the danger zone".

### **Funding**

University of Arizona Cooperative Extension Statewide Safe Food 2010 Initiative  
Yavapai County Board of Supervisors

### **Goal 3: *A healthy, well-nourished population***

#### **Better Nutrition Through EFNEP**

##### **Issue**

EFNEP, the Extension Food and Nutrition Education Program, addresses the needs of low-income, minority families and youth nationwide. The goal is to teach strategies for choosing and preparing nutritious foods while saving money. It also helps these families make informed choices about food and other lifestyle issues that support family health and well-being. Funded nationally by the USDA, EFNEP is staffed locally in each state and the U.S. territories by Extension-trained nutrition educators.

##### **What has been done?**

Arizona's EFNEP program is offered in 5 of the state's 15 counties. The EFNEP curriculum includes methods of meal planning, food shopping and budget management skills, handling food properly, food storage and sanitation as well as improving family nutrition and health. By the time the graduate from the program, participants have learned how to use government-issued commodity foods, compare food labels, and choose a healthy diet while still cutting expenses.

##### **Impact**

In 2001-2002 more than 2700 low-income families and 11,640 youth attended EFNEP classes in Arizona. Of these, 81 percent were minorities (Hispanic, black, Asian and American Indian). As a result of the program, nearly 94 percent reported positive changes in choosing healthy items for meals. About 80 percent improved their general nutrition overall, and 65 percent improved their food safety practices. Although it ranked 7<sup>th</sup> in overall behavior change compared with 10 other states in its funding range during 2002, Arizona ranked 1<sup>st</sup> in actual dietary improvement from entry to exit from the program.

##### **Funding**

Smith-Lever 3(d) e.g., EFNEP

In-kind agency as well as cash donations and small grants

#### **Walk Across Arizona—Exercise Program for Seniors**

##### **Issue**

With the US population over age 65 growing rapidly, public interest in improving the quality of life for "seniors" is increasing. Many of the diseases commonly thought to accompany aging can be prevented and seniors are looking for ways to keep their remaining years healthy, active, and enjoyable. In 1997 a statewide Partnership was established that combines the resources of the



college of Public Health (COPH) and Cooperative Extension (CE). An essential component of the community Health Advancement Partnership (CHAPS) in Pima County is to help contain health care cost through the development and evaluation of an effective seniors lifestyle program that could be maintained in a community and replicated in other communities in Arizona.

### **What has been done?**

In 2000 the Health and Human Services Committee (HHSC) of Green Valley Community Coordinating Council (GVCCC) formulated a set of visions for a healthy Green Valley based upon a 1998 needs assessment. One specific vision was to “Promote a Healthy Lifestyle” among residents of the community. A forum was held as part of the HHSC community meetings to focus on how to implement the vision of a healthy lifestyle. Task members were identified, and regular meetings have been held since September of 2000 with the CHAPS acting as the lead agency. This collaborative effort with the retirement community led to the development of “Walk Across Arizona” using formats and materials similar to programs used in Michigan and Texas. The theoretical basis for the program was to use social support networks to increase physical activity levels within the community by developing and maintaining walking clubs.

The 16-week walking program is designed for teams of up to 10 people. The teams have a friendly competition to see who can get their pals, neighbors, co-workers, and family out to build a healthy habit and walk for fitness. To evaluate the success and benefits of the benefits of the walking program, entry, exit, and tracking forms were developed to characterize the participants, and to track their physical activity habits, levels of energy, social interaction, and satisfaction with their community. The miles logged by teams are collected by team captains each week and recorded on Arizona maps posted at various places around the community, so everyone can see the progress. Participants pay a \$5.00 registration fee for cost recovery of materials and program incentives. Additional sponsorship from community agencies and businesses were sought to provide extra incentives at the program kick-off and culmination.

The 2002 –2003 16-week campaign is currently underway with the expansion to 5 additional counties, Apache, Cochise, Maricopa, Santa Cruz, and Yuma. Each county has a link from the Walk Across Arizona site, [www.walkacrossarizona.org](http://www.walkacrossarizona.org), where teams can register online and county leaders can update a calendar of monthly activities.

### **Impact**

In the first year of the campaign, 34 teams of 10 individuals walked 48,872 miles with 329 registered participants; the average number of days walked by participants increased from 4.1 at entry to 4.6 upon exit, and an average of 11.4 miles per person and 91.2 miles per team were walked per week. The second year of the campaign started in mid-November 2002 with 35 teams registered, including 12 Cooperative Extension teams that were part of the Family and Consumer Science Healthy Lifestyle initiative in 6 counties: 355 individuals reported 23,287 miles walked as of December 31, 2002.

“I enjoy being part of a team because it keeps me accountable. Our captain constantly motivates us, which makes the program fun. I have more energy than I did at the start of the program and I plan on continuing even after Walk Across Arizona ends!” –participant

## **Funding**

Smith-Lever Funds

Participant fees

20 Community collaborators/sponsors

## **"Healthy Weight 4 Life"**

### **Issue**

Overweight and obesity affect more than 50 percent of the U.S. population, according to recent figures from the Centers for Disease Control. There is a critical need for effective weight management programs that integrate all the factors that contribute to obesity. A university environment can facilitate multi-disciplinary, collaborative approaches combining research and community outreach. At the University of Arizona, researchers in the College of Agriculture and Life Sciences, and the College of Medicine, are working together to develop and test a sound, scientifically-based weight loss program.

### **What has been done?**

Faculty from the Department of Nutritional Sciences in the UA College of Agriculture and Life Sciences and the Department of Physiology in the UA College of Medicine developed a comprehensive weight loss program called “Healthy Weight 4 Life.” One hundred fifty women enrolled in 2001. Phase One includes a weight loss curriculum emphasizing four elements: increased physical activity, healthy eating, developing healthy interpersonal relationships, and dealing with psychological and emotional barriers to weight loss. Phase Two features 18 months of subsequent online support that offers encouragement for participants in maintaining their weight loss. The Web-based format is more cost-effective than weekly face-to-face follow-up meetings. The UA researchers are testing this method for its efficacy and usefulness in promoting and maintaining long-term weight loss.

### **Impact**

Of the 150 women who began the program in 2000, the average weight loss during the first 16 weeks was 11 pounds. Some women lost more than 40 pounds. More than 75 percent of the women enrolled in Phase Two, the online support phase, have maintained their weight or continued to lose more weight over the first 12-18 months of follow-up. Some of the women in the program bordered on class II obesity when they started. Over the past year, the program has been successfully translated into a broader community program in Tucson, with an advisory board of former research participants helping to coordinate and administrate the effort.

“I lost 44 pounds and now I am able to wear clothes I haven’t worn in years. How is this program different from others I have tried? It has all the elements to succeed. The nutrition, the hydration, the physical activity, mind and body, and the support groups. My physical activity grew from none to 500 to 600 minutes of activity a week or sometimes more. Thanks to this program, I started the New Year with a size 8, [down] from a size 16 or sometimes 18. Believe me, I do not miss my previous size.”

—participant

“The program was a lot of things to me...fun, new friends, professional people to learn from, informational in terms of exercise and nutrition, but most of all it took me from feelings of isolation, despair and depression over my weight and physical health to feelings that I am not alone with my struggles and I can control my weight and to some extent my physical health.”

—participant

### **Funding**

Hatch Act

National Institute for Diabetes, Digestive and Kidney Diseases

### **Goal 4: *Greater harmony between agriculture and the environment***

### **School IPM in Phoenix and on Arizona Indian Reservations**

#### **Issue**

Most schools in Phoenix and elsewhere in Arizona routinely spray their facilities with pesticides to control an assortment of fire ants, cockroaches, mosquitoes and bark scorpions. Each month the treatments are repeated as part of an outdated pest prevention program that doesn’t work. Unacceptable pest populations remain a problem in these schools. At the same time, while the poisons are applied and reapplied, parents pull their children out of school for a day or two each month to avoid pesticide exposure. In April 2000, the Kyrene school district in metropolitan Phoenix tried another approach and brought in a team of specialists that included entomologists from the University of Arizona.

#### **What has been done ?**

Three schools in the Kyrene district were chosen for a pilot Integrated Pest Management (IPM) project, to control pests while avoiding reliance on chemical pesticides. The schools concentrated their efforts (and capital resources) on identifying what the pests were, finding where they came from and preventing their entry into buildings. The custodial and kitchen staffs also were mobilized to learn how to spot trouble. All of the openings around pipes and conduits were sealed, crawl spaces were closed off, and drains and building slabs were repaired to inhibit cockroaches. Trees were trimmed back and birds were encouraged to roost where their droppings

wouldn't contaminate walkways and other high traffic areas. The new program initially came from Indiana University (IU). IU entomologist Marc Lame had done a pilot study in the Midwest and wanted to try a similar program in the desert Southwest.

### **Impact**

The IPM final evaluation showed that the schools reduced their pesticide applications by 90 percent and kept pest populations below 85 percent of their original levels. The program has been expanded to 27 sites in the Kyrene School District.

In 2001 a new pilot program began on The Navajo Nation in three Bureau of Indian Affairs schools. The main pest issues at the sites included rodents, bed bugs and house flies. The final evaluation showed that the pilot schools reduced chemical pesticide use by more than 90 percent and also reduced pest incidence by more than 60 percent. The program has now been expanded to include all the BIA schools on the Navajo, Hopi and south Pueblo reservations. A new pilot program also began on the Gila River Indian Reservation in fall 2002.

The structural IPM program continues to grow: 1) UA faculty are currently working with the Arizona Structural Pest Control Commission on ways to provide pest control companies with certification that will recognize those who practice IPM techniques, and 2) a UA faculty member has been appointed vice president of the International Urban IPM Association.

### **Funding**

University of Arizona Cooperative Extension

Environmental Protection Agency

## **A Western Regional Land-Grant Web Initiative for Rangeland Management**

### **Issue**

In 1995, a collaboration began at the University of Arizona to create one of the first fully operational components of the Agriculture National Information Network (AgNIC), an initiative involving multiple land grant universities and the U.S. National Agricultural Library. Conceived as a means to distribute basic information to the public, specialized information to land managers, and instruction to students, the Managing Rangelands AgNIC web development project united the University Library with the School of Renewable Natural Resources, the Arid Lands Information Center, and the Networking Group of the Educational Computing and Technology unit in the College of Agriculture and Life Sciences with a common goal of providing timely, accurate, trusted information on Western rangelands. Initially, the effort focused on Arizona, but following a regional workshop held at the UA in 2002, a new "Rangelands of the Western U.S." web resource has been developed as part of a multi-state collaborative effort.

## **What has been done?**

Recognizing that Western rangelands and environmental issues do not stop at political boundaries, the March 2002 workshop explored the possibility of forming a Western regional rangelands alliance to develop a comprehensive Web-based resource on current issues and knowledge related to U.S. Western rangelands. This resource would build on the UA's six-year effort in creating the Managing Rangelands web site which is part of the Agriculture Network Information Center (AgNIC) national initiative. The workshop's 22 participants included representatives from 12 Western land-grant institutions, the Policy Analysis Center for Western Public Lands, the Society for Range Management, and the AgNIC Coordinator from the National Agricultural Library. It was unanimously decided to pursue a common agenda including the development of a regional web site and closely-linked state sites, with the UA taking the lead on initial development activities for the first year. This resulted in a redesign of the existing Managing Rangelands site into a regional home page [<http://rangelandswest.org/>] and a series of state-specific linked sites [see Arizona Rangelands at: <http://rangelandswest.org/az/index.html>]

Over the past seven years, the Arizona site has been regularly updated and expanded both in content and design to improve its ability to serve rangeland students and land managers. It includes more than 350 unique pages and features. Besides an archive of full-text articles published in the *Journal of Range Management* and other in-depth sections on rangeland management, the web site includes a section on weeds and invasive species, and sections on marketing and conservation ranching. In cooperation with the Natural Resource Conservation Service (NRCS), Ecological Site Guides covering all areas of Arizona are also available. These guides describe soil qualities, vegetation, precipitation, and other factors that affect decision-making in land management.

One of the initial motives for selecting rangelands as the University of Arizona's contribution to AgNIC was the controversial nature of the issues surrounding the topic. The goal was to develop a major section whose purpose was to defuse those issues and provide access to balanced and trusted information. To that end, a major section is focused on policy issues concerning public land management, including such topics as wildlife and endangered species, forests and logging, mining, Indian lands, urbanization, grazing, recreation and wilderness areas. In addition to covering the different sides of such contentious issues, the web site provides extensive background information on legislation impacting rangelands, such as the National Environmental Policy Act (NEPA) and the Clean Water Act. These sections are now being expanded through the new regional partnership and are available from the regional home page.

## **Impact**

The Rangelands of the Western U.S. web site is widely accepted as an important source of information on the understanding and management of Western rangelands. On average, the site receives more than 2,200 hits per day, bringing the total during 2002 to approximately 760,000. In addition, the newly established Western partnership is an accepted model for collaboration within the national AgNIC effort.

Informing the Public: Through information obtained from users who send in reference questions via the site, it can be seen that a broad cross-section of the public benefits from the Web site's capabilities. Throughout the past 7 years, questions have been sent in by students from middle school through the post doctoral level. In addition, reference questions have been received from landowners in Arizona, with others coming from people in Oregon, Texas, New Mexico, and as far away as Iran and Jordan. One staff member from the U.S. Forest Service sent the following comment: "This is a great site; made me proud to be an alum. Thanks for the obvious effort that went into it. Appreciate the effort at achieving balance in the discussion."

## **Funding**

Smith-Lever Funds

Arizona Common Ground Roundtable (in kind)

College of Agriculture and Life Sciences

Cooperative State Research, Education, and Extension Service

NASA/Raytheon

Natural Resources Conservation Service (in kind)

University Library

## ***Goal 5: Enhanced economic opportunity and quality of life for Americans***

### **High School Financial Planning Program**

#### **Issue**

To enhance the financial well-being of teenagers in their adult years, it is essential that they become knowledgeable about personal finance. This is especially true considering current trends reflecting rising personal bankruptcies, consumer credit delinquencies, and inadequate savings for retirement among adults. Studies concerned with the financial knowledge of teens have reported that teenagers are progressing into adulthood without the basic skills and knowledge it takes to make educated financial decisions once they are on their own. Additionally, the spending power of teens continues to increase. Survey results released in April, 2002 by the National Jump\$tart Coalition for Personal Financial Literacy show high school seniors know even less about credit cards, retirement funds, insurance, and other personal finance basics that they did five years ago. On average, participants (12<sup>th</sup> graders) answered 50.2% of the questions correctly - a failing grade based on the typical school grading scale.

#### **What has been done?**

Since 1991 the University of Arizona Cooperative Extension in partnership with the National Endowment for Financial Education (NEFE), and local teachers, have educated high school

students about basic money management and financial planning concepts. Over the past 10 years, the University of Arizona extension faculty have worked with classroom teachers to provide support for the HSFPP Curriculum. A new partnership with the Arizona Credit Union League, Inc. is providing a tremendous opportunity for additional classroom support and professional development for teachers. Many of their professionals across the state are willing to team up to increase the financial literacy of youth. Additionally, the Students in Free Enterprise (SIFE) at the University of Arizona are willing to assist with the program. The University of Arizona Cooperative Extension will continue to promote and expand the HSFPP in the state of Arizona.

### **Impact**

Approximately 80,121 Arizona high school students and other young people have increased their knowledge of money management skills since this program began. As a result of participating in the NEFE High School Financial Planning Program (HSFPP), 86 percent of students demonstrated an increase in financial knowledge or behavior when dealing with money; 92 percent reported three months later that they believed the way money is managed affects their future; 84 percent felt confident in making financial decisions, 58 percent changed spending habits and 56 percent improved saving habits.

Establishing a savings account was identified by the greatest number of students when asked about the most important thing they did as a result of participating in the HSFPP. This finding is particularly noteworthy since a recent study from the National Bureau of Economic Research indicates that if you teach a teen to save, he or she will save more as an adult.

“I compare prices when I shop. I know more about credit and insurance, and I feel more confident about money.”

–participant

### **Funding**

Smith-Lever Funds

National Endowment for Financial Education (NEFE)

Federal: No Child Left Behind Act of 2001

Arizona Credit Union League, Inc.

### **Grandparents Raising Grandchildren**

#### **Issue**

One in ten grandparents has been the primary support of a grandchild at some time in his or her life. In Arizona, 7 percent of all children under age 18 are living in a household headed by a grandparent. Figures reported in the 2000 census show a 73.8 percent increase since the 1990 census with Arizona ranking fourth highest in increase of grandparent-headed households nationally. Many organizations that provide services for both generations are not prepared to deal with the special needs that may arise. Legal options are limited and emotionally draining and financially expensive.

## **What has been done?**

Grandparents Raising Grandchildren Southern Arizona Coalition (GRGSoAZ) was formed in 1999 as an outgrowth of the National Satellite Conference on Grandparents Raising Grandchildren. With leadership from the University of Arizona Cooperative Extension, coalition members, and representatives from grandparent support groups in Pima, Maricopa, Cochise, Graham and Yuma counties worked together to determine needs and priorities. The GRG Coalition has become a network of professionals representing 35 agencies to collaborate and meet the needs of GRG. Agency personnel contribute time, in-kind resources and cash to meet the needs of GRG through development of the GRG Resource Notebooks, annual conferences, and activities at the Kinship, Adoption, Resource, Education (K.A.R.E.) Family Center. The coalition actively interacts with the Governor's Advisory Council on Aging Task Force for Grandparent Concerns in Maricopa County that comprises 15 agencies. In 2002, Coconino County Extension in collaboration with Northern Arizona Gerontology Association formed a support group for GRG and established an ethnically diverse 14-member advisory committee to identify critical needs and develop a vision to provide better services for kin caregivers in Northern Arizona.

In the early efforts of the GPRG SoAZ coalition, 700 resource notebooks were developed with 1032 volunteer hours that contained material and community resources available in the following areas: support groups, legal and financial issues, childcare and school support, parenting tips, and nutrition and health issues. Notebooks were distributed free throughout the community. The coalition holds an annual conference for grandparents, employs a full-time program coordinator, maintains and updates a grandparent support website, [www.ag.arizona.edu/grandparents](http://www.ag.arizona.edu/grandparents). Other activities included the grand opening of the K.A.R.E. Family Center in Tucson on February 7, 2002, the first and only "One-Stop-Shop" for Arizona and a model for other communities. KARE is a collaboration of Arizona's Children Association, Casey Family Program, the Pima Council on Aging and the University of Arizona Cooperative Extension.

## **Impact**

By the end of 2002 the number of monthly support groups in Arizona for grandparents had increased from 1 early in the year 2000 to 22 (Pima 13, Maricopa 4, Yuma 2, Mohave 1, Coconino 1 and Cochise 1). During 2002, the K.A.R.E. Center had 1300 contacts from local grandparents at public and community events, and reached 11 percent of grandparents raising grandchildren in Pima County. Through leveraged funding and community collaboration, 475 revised GRG notebooks were assembled and 257 distributed in 2002. Maricopa County provided outreach to 70 grandparents raising grandchildren through support groups, conference and one-to-one mentoring. Coconino County reached 25 kin caregivers and applied for grant funding to develop a survey instrument to further identify GRG needs in their county.

"I'm so glad that we have a support group for GRG. We are thankful that we have a caring person like Jessica. She really is concerned about grandparents and their grandchildren."

--Phoenix grandparent raising her grandchild

"The KARE Center was there for us when we didn't know what to do."

--Tucson grandparents raising their grandchild



“The resources in the GRG Resource Notebook have greatly increased my ability as a professional to assist grandparents raising grandchildren. The notebook has decreased the stress level of grandparents I work with.” --Case Manager from Area Agency on Aging

## **Funding**

Arizona Cooperative Extension and more than 60 local community agencies

Community Services Block Grants

## **Arizona 4-H Teen Road Trip**

### **Issue**

Retention and recruitment of teen members in 4-H is a problem nation-wide. When asked what would help recruit new teens and keep current members in 4-H, the Maricopa County 4-H Teen Association suggested a road trip like the one on MTV. The rationale was that with multiple parents in the workforce, many families cannot afford the cost or time to take family vacations. Youth have become accustomed to being able to attend affordable 4-H events where they have made friends, learned valuable skills and had fun.

### **What has been done?**

Arizona 4-H Road Trip is an invitational opportunity for teens aged 13-18, sponsored by the Maricopa County 4-H teen program and UA Cooperative Extension. Begun in 2001, the trip takes place "on the road" throughout a chosen region of Arizona and surrounding states in July. Activities promote communal living, trust-building, exploration, personal responsibility, interactive and interpersonal skill development and problem solving. Teenagers of various backgrounds gather from five Arizona counties to engage in the five components of the Road Trip: interactive geography/history lessons; service learning; work force/career exploration; cultural/diversity awareness and appreciation; and technology in action. Participants develop a strong sense of teamwork and community, learn to adapt to new situations, learn how to live and work with others, participate in new activities and function as a working youth/adult partnership team. Conflict resolution, relationship building and trust skills create the "road trip community", promoting and strengthening participants' abilities to thrive in various situations and environments.

Participants photographed sites during the trip and worked with a 4-H agent to download them to the web site and in the form of electronic postcards. Anyone with access to the Internet could follow the trip, interact via e-mails and ask questions of the group. At least two hours per night were spent creating a traveling camp so other teens and interested parties could experience a "virtual" Arizona road trip. See [www.arizona.edu/4-H/roadtrip/](http://www.arizona.edu/4-H/roadtrip/)

### **Impact**

In only its second year, the camp grew from 12 participants to 25 - a large size group for the intensive experience created by road travel of over 1000 miles. Participants of "Road Trip II - Five Hundred Years of Exploration" showed an increase in knowledge, aspirations, skills and attitude in the following: ability to live and work with others - 21.5 percent; ability to accept responsibilities -15.1 percent; willingness to try new things - 28.2 percent ; leadership skills and abilities - 16.5 percent; ability to make new friends 15.5 percent; ability to trust others 20

percent; ability to logically solve problems in a group 16.2 percent; adapt to new situations - 25.5 percent; and to participate in new activities and challenges -27 percent. Fifty percent of the 2002 participants were returning for their second time to Road Trip.

“It’s 4-H - it’s all about making friends. And on the road trip, even though some people didn't like each other in the beginning, they finally realized, ‘Hey, I’m stuck with them for the rest of the trip!’” And eventually, everyone was best friends.” – Road Trip II participant

“Teen Road Trip is a fun opportunity to learn about different cultures/diversities, people and situations. Fun, exciting, interesting and educational all in one!” – Road Trip II participant

### **Funding**

Smith-Lever Funds

Private registrations

### **Tobacco Use Prevention Program**

#### **Issue**

The Department of Health and Human Services reported in July ‘98 that “Persons with lower income or education had a higher prevalence of health risk factors such as cigarette smoking.” In 1995, the least educated men and women were more than twice as likely to smoke as the most educated. A survey released in July ‘98 by Arizona Department of Public Services reported that 15 percent of high school age youth had smoked in the last month, compared with 36.4 percent nationally in 1997. The Arizona survey found that the rate of tobacco use in the past month was less than 1 percent for youth in the 10-11 age group (fifth and sixth grades), and that it gradually increased to 21.2 percent for youth in the 16-17 age group (junior and seniors in high school). Surveys conducted in the Tempe, Ahwatukee, and Guadalupe Tobacco Prevention Program (TAG TUPP) communities showed that youth in this region are most likely to begin experimenting with cigarettes from 11-13 years of age. More than 80 percent of the students said it was very important to have activities that educate youth on the harmful effects of tobacco.

#### **What has been done?**

The 4-H Tobacco Use Prevention Program encourages youth to become actively involved in their communities as recognized tobacco use prevention education resources. The targeted communities include Tempe, Ahwatukee and Guadalupe, Arizona. Under the guidance of professional staff members from the University of Arizona Cooperative Extension, seventh and eighth-graders are trained as peer leaders to teach the Tobacco Risk Awareness Program (TRAP) to younger youth. TRAP provides factual information about the health risks of tobacco usage. The program includes information and curriculum on smokeless tobacco and smoking tobacco dangers, videos and fun hands-on activities. The premise is that youth will gain knowledge of the health hazards of tobacco use and will not use tobacco as teens or adults.

#### **Impact**

As of June 30, 2002, 189 youth from the sixth, seventh, and eighth grades were recruited and enrolled as peer leaders in four communities in Tempe, Arizona. Eighty-two peer leaders (54.67 percent) increased their public speaking presentation skills by 72 percent based on pre- and post-listener evaluation surveys. Seventy-eight peer leaders (52 percent) increased their knowledge in leadership by 63.3 percent based on pre- and post- leadership skills assessments. Peer leaders presented anti-tobacco demonstrations based on Tobacco Risk and Awareness Prevention curriculum to 381 youth in the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> grades in the four communities.

“Not only have I learned about tobacco prevention, I’ve also learned about being a leader. I have taught kids about the dangers of smoking.”

–middle school peer leader

## **Funding**

This program is conducted by the University of Arizona 4-H Youth Development and is funded by Tempe, Ahwatukee, Guadalupe Tobacco Use Prevention Program (Centro de Amistad, Inc.), Maricopa County Tobacco Use Prevention Program and Arizona Tobacco Education Prevention Program.

## **Operation Cool Shade**

### **Issue**

Studies show that proper shading of the home can reduce energy consumption by as much as 20 percent. The University of Arizona Cooperative Extension in Pima County joined with Tri-Co Electric Cooperative to distribute shade trees to residents for energy conservation.

### **What has been done?**

Tri-Co Electric Cooperative and Pima County Extension provided trees and training, respectively, to interested residents. A requirement of the program was that trees be planted in locations around the house to ensure maximum shading. The residents received training from Extension on correct placement, planting and care of trees. Master Gardeners were trained to conduct training for program participants on the correct selection, placement, planting and care of shade trees. Four programs were conducted in 2002 with 117 participants, by 8 Master Gardener volunteers. An additional four Master Gardeners staffed a tree planting and care answer booth at the tree distribution day conducted by TriCo Electric Cooperative's headquarters in Marana. Tri-Co employees conducted follow-up inspections to ensure that trees were planted in the pre-determined locations and that the trees remained in good health. (Follow-up information and assistance with tree care is provided by the Pima County Cooperative Extension.)

### **Impact**

As a result of Operation Cool Shade, in 2002, 1,469 trees were distributed to 509 electric cooperative customers. Since 2000, a total of 5,081 trees have been distributed to 1790 customers. Studies have shown that proper shading can reduce home energy consumption by as much as 20 percent. Thus given the average peak household consumption (July, August and September) of 7,263 kilowatt hours and the current rate of \$0.0953 per KWh, the average

projected savings for individual households participating in Operation Cool Shade for the three-month period is 1,453 kWh, with a dollar savings of \$138.47 during that time. In terms of all 509 participating households, the projected savings is 883,424 kWh and \$70,481 for the peak three-month summer period.

**Funding**

Smith-Lever Funds

TriCo Electric Cooperative

## STAKEHOLDER INPUT PROCESS

### 1) Advisory Boards

#### a) *Cooperative Extension.*

The Legislature of the State of Arizona accepted the provisions of the Smith-Lever Act in 1915. It authorized the Board of Regents of the University of Arizona, the Land Grant University in Arizona, to “organize and conduct agricultural Extension work which shall be carried on in connection with the College of Agriculture and Life Sciences of the UA in accordance with the terms and conditions expressed in the Act of Congress aforesaid”. This State legislation also empowered county governments to appropriate funds for the county Extension program.

Currently, according to Arizona State Law *ARS 3-124-127*, each County Extension Board consists of seven persons, who are residents of the county, four of whom have as their principal business the production of agricultural commodities, and the other three of whom are representative of organizations or persons who utilize the county Cooperative Extension offices. Extension faculty are sensitive to including membership representative of their county regardless of racial or ethnic background. Names of Advisory Boards for each Arizona county are available at the Cooperative Extension web site (<http://ag.arizona.edu/extension/>).

The County Extension Boards have three responsibilities. First, in order to build educational program priorities that are based on needs of local people, the Extension Board must approve the Annual County Plan of Work. The county Extension faculty present a prioritized list of potential programs and the Board may suggest others. In setting priorities, Cooperative Extension is interested in involving a broad-based, representative county group that may include commodity groups, 4-H councils, family consumer groups and community development groups.

Another role of the County Extension Board is to annually approve the county Extension budget, submitted to the Extension Board by the County Director. This budget covers all funds expended for Extension work in the county. According to the legislation, the Board of Supervisors of each county must provide reasonable rent-free office space for the conduct of extension work in that county.

Finally, the Extension Board approves the Annual Report of Extension work in the county. County reports are available at the Cooperative Extension web site.

#### b) *Experiment Station*

Individual advisory boards have been established for each of the following Agricultural Centers: Maricopa and Citrus, Safford, Yuma, Oracle, Santa Rita Experimental Range and the V-V Ranch. The boards have representatives from the agricultural community, the agri-business community and include consumer representatives who are appointed on a rotational basis. These boards meet from two to four times per year to review ongoing programs and make recommendations for change. In addition, the State 4-H Youth Development program, the Departments of Agricultural and Biosystems Engineering and Animal Science and the Schools of Renewable Natural Resources and Family and Consumer Studies have separate advisory committees that provide input

to the programs of these units.

## 2) State Program Evaluation

Accountability is increasingly important to secure new resources, maintain visibility, and market effectiveness. Every faculty member in the College of Agriculture and Life Sciences provides an Annual Performance Report (APR) of accomplishments and impacts for the previous year, and a plan of major commitments for the coming year. As of February 1, 2002, faculty prepare their APRs on-line, in a new system called APROL.

By the year 2004, the College of Agriculture and Life Sciences will have a searchable database of programs and their impacts. Key components of the database are: (1) college-wide reporting, linking extension, research and teaching; (2) agricultural experiment station reporting of federal project data; (3) Cooperative Extension reporting of federal clientele contact data and outreach activities.

In the past year, Cooperative Extension sponsored several program retreats focusing on two grass-roots generated initiatives: 1) natural resources and water and 2) sustainable communities. Programmatic support, monitoring support and political support are being generated to accomplish the goals of these programs. Statewide program priorities for the next three to five years were identified during these exercises. Extension faculty are committed to an on-going process of self-improvement in outreach programs.

## 3) Public Input for College of Agriculture and Life Sciences Programs

Public input is extremely important to the College of Agriculture and Life Sciences. Because we are a Land Grant College committed to serving the needs of the State of Arizona, the College regularly seeks stakeholder input, programmatic feedback, and advice on future directions from citizens. As noted above, Extension Advisory Boards provide stakeholder input to Extension faculty on a yearly basis.

This past year we have focused on getting input on our family and youth programs. In each county of the state, at the state capitol, and at the University we involved 174 adults and 144 youth along with 12 state officials in a conversation on the future of 4-H and youth programs. Over 1000 hours of staff and volunteer time were devoted to this public input.

As part of the national effort celebrating 100 years of 4-H, 12 public discussions (forums) were held on the future of College 4-H youth programs. Over 150 people, including state leaders, students, elected officials, partners (e.g. scouts), 4-H volunteers and UA faculty participated. Youth insights and recommendations for future programming effort were given high priority.

Finally, the College is initiating an annual stakeholders forum to refine the vision of the College of Agriculture and Life Sciences. Reflecting on input from a major College stakeholder study in 1988, and in light of mail surveys to clientele and public discussions held in the past three years, a major public forum will be held in May of this year focusing on Goal 1 of the USDA, CSREES:

An agricultural production system that is highly competitive in the global economy. Next year it is anticipated that goal 5 (Greater harmony between agriculture and the environment) will be the topic of the forum. The other three goals will be presented and discussed in subsequent years.

### **PROGRAM REVIEW PROCESS**

There have been no significant changes in the program review processes submitted in the 5-Year Plan of Work.

### **EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES**

Continued progress has been made on nearly all of the goals and outcomes outlined in the 5-Year Plan of Work. Much of this can be attributed to our multi-state and integrated programs. We continue to be involved in more than 40 separate multi-state projects and coordinating committees which, coincidentally, allowed us to have direct interaction with scientists from more than 40 separate agricultural experiment stations from the various states and territories. This interaction also involves an increasing number of individuals who have their primary appointment with Cooperative Extension. The relatively small amount of federal dollars that are committed to this process leverages a very significant number of resources in terms of personnel and operations to solve many of our regional and national problems. Arizona is fully committed to this process and will remain a strong player in the formalized multi-state effort.

As noted before, Arizona has a fully integrated research and extension program. This is evidenced by the fact that nearly all of our extension specialists have split appointments as do many of the research faculty. The split responsibility model is carried up through the department heads, center directors and at the dean/director level where resource decisions are made jointly by research, extension and academic program leadership. Therefore, we have minimized distinctly separate extension and research programs. Rather we have a situation in which some activities are largely “extension” oriented, some that are largely “research” oriented and a very large body of activity in the middle that represents a combination of efforts. Much of our day to day progress can be attributed to the joint and collaborative efforts that emerge from this working model.

As noted above, most of the multi-state “research” activities are conducted through the formalized multi-state programming effort. In the Plan of Work we also outlined a formalized effort with New Mexico and Utah, involving mostly county extension personnel and designed largely to meet the needs of the Native American community. This activity is ongoing and productive.

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

**Institution** University of Arizona  
**State** Arizona

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

	Actual Expenditures				
Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
<u>As described in 5 yr. plan of work</u>	<u>174,917</u>	<u>172,383</u>	_____	_____	_____
<u>1. Agricultural production system competitive in global economy</u>	_____	_____	<u>77,855</u>	_____	_____
<u>2. Safe, secure food and fiber system</u>	_____	_____	<u>21,519</u>	_____	_____
<u>3. Healthy, well-nourished population</u>	_____	_____	<u>12,083</u>	_____	_____
<u>4. Greater harmony between agriculture and environment</u>	_____	_____	<u>5,820</u>	_____	_____
<u>5. Enhanced economic opportunity and quality of life</u>	_____	_____	<u>55,570</u>	_____	_____
 Total	 <u>174,917</u>	 <u>172,383</u>	 <u>172,847</u>	 _____	 _____

Form CSREES-REPT (2/00)

\_\_\_\_\_  
 Director  
*Jim Christenson*  
 Date March 11, 2003



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

**Institution** University of Arizona  
**State** Arizona

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

	Actual Expenditures				
Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
<u>As described in 5 yr. plan of work</u>	<u>63,818</u>	<u>63,692</u>	<u>          </u>	<u>          </u>	<u>          </u>
<u>1. Agricultural production system competitive in global economy</u>	<u>          </u>	<u>          </u>	<u>17,731</u>	<u>          </u>	<u>          </u>
<u>2. Safe, secure food and fiber system</u>	<u>          </u>	<u>          </u>	<u>7,488</u>	<u>          </u>	<u>          </u>
<u>3. Healthy, well-nourished population</u>	<u>          </u>	<u>          </u>	<u>3,948</u>	<u>          </u>	<u>          </u>
<u>4. Greater harmony between agriculture and environment</u>	<u>          </u>	<u>          </u>	<u>2,719</u>	<u>          </u>	<u>          </u>
<u>5. Enhanced economic opportunity and quality of life</u>	<u>          </u>	<u>          </u>	<u>31,762</u>	<u>          </u>	<u>          </u>
<b>Total</b>	<u>63,818</u>	<u>63,692</u>	<u>63,648</u>	<u>          </u>	<u>          </u>

Form CSREES-REPT (2/00)



**March 11, 2003**  
Date

**Appendix C**  
**U.S. Department of Agriculture**  
**Cooperative State Research, Education, and Extension Service**

**Supplement to the Annual Report of Accomplishments and Results  
Multistate Extension Activities and Integrated Activities  
(Attach Brief Summaries)**

**Institution** University of Arizona  
**State** Arizona

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

	Actual Expenditures				
Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
<u>As described in 5 yr. plan of work</u>	<u>161,119</u>	<u>158,784</u>	_____	_____	_____
<u>1. Agricultural production system competitive in global economy</u>	_____	_____	<u>92,825</u>	_____	_____
<u>2. Safe, secure food and fiber system</u>	_____	_____	<u>1,065</u>	_____	_____
<u>3. Healthy, well-nourished population</u>	_____	_____	<u>0</u>	_____	_____
<u>4. Greater harmony between agriculture and environment</u>	_____	_____	<u>21,926</u>	_____	_____
<u>5. Enhanced economic opportunity and quality of life</u>	_____	_____	<u>43,395</u>	_____	_____
<b>Total</b>	<u>161,119</u>	<u>158,784</u>	<u>159,211</u>	_____	_____

\_\_\_\_\_  
Director  
*Jim Christenson*

March 11, 2003  
Date