UNIVERSITY OF ARIZONA

COLLEGE OF AGRICULTURE AND LIFE SCIENCES

AGRICULTURAL EXPERIMENT STATION
&
COOPERATIVE EXTENSION

Annual Report of Accomplishments and Results

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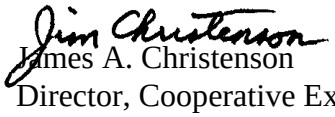

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PROGRAMS

Overview :

With this report we conclude work on our previous plan of work. Much has been accomplished. Each year we provide examples on new efforts. Cumulative impact over the years is quite impressive. Partnerships, integration and collaboration are the cornerstones of the College of Agriculture and Life Sciences programs at the University of Arizona. Research and Extension programs are integrated in the scholarship of discovery, integration and application. Extension specialists carry a joint research appointment and many research faculty 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: Competitive agricultural systems in a global economy

Managing Lygus Bug in Cotton

Impact Nugget

In response to Arizona Cooperative Extension's IPM program for managing Lygus bug, more than 50 percent of the region's cotton growers have changed their chemical tactics against Lygus by switching to single compounds used strategically and at appropriate rates as part of an IPM system. This has resulted in a 66 percent reduction in the number of acres receiving spray mixtures for Lygus, while increasing effective rates by about 20 percent. Education efforts across the border in Mexicali, Mexico have resulted in the majority of cotton growers there adopting threshold and other IPM guidelines for Lygus management.

Issue

Integrated pest management (IPM) plans must be flexible enough to accommodate different insect pest pressures from year to year. After years of lesser recognition as a cotton pest, Lygus bugs have become the number one pest of cotton since 1998. Among growers, typical control measures for Lygus have involved tank mixing combinations of broad-spectrum insecticides in the unfounded hope that this practice will give more control over the pest.

What has been done?

The UA College of Agriculture and Life Sciences has developed an integrated pest management program (IPM) for Lygus in cotton aimed at reducing insecticide use through adequate field sampling, adherence to threshold guidelines, and using the right compound for the job. Above all, it emphasizes avoiding pest pressures wherever possible. These measures are being incorporated into

the larger cotton pest management program, and focus on reducing spray applications from mixed broad-spectrum insecticides to more selective, targeted single insecticide applications. One key to the success of the program has been the accurate identification of single spray compounds that perform consistently against Lygus and knowing precisely when to use them. The education component of this program has assisted growers in implementing this strategy during the last nine seasons.

Through dedicated screening trials conducted each year, three new reduced-risk technologies have been identified which may provide selective control of Lygus bugs. This research conducted in collaboration with agrochemical companies should lead to new registrations that will aid growers in transition away from broadly-toxic insecticides for Lygus control and facilitate IPM programs that seek to conserve natural enemies useful in pest control.

Because Lygus bugs survive and multiply on many different hosts, a collaborative project was conducted with growers in a large agricultural area and with the Arizona Cotton Research and Protection Council to determine the factors that contribute to the abundance of Lygus populations. These studies, part of a larger cross-commodity program in the UA College of Agriculture and Life Sciences, identified key sources of Lygus populations and provided guidelines on planting patterns and distances that should help avoid Lygus problems in the future.

Through use of spatially-explicit information in a geographical information system (GIS), educators can now advise growers that sensitive cotton crops will be negatively affected by other Lygus sources, such as seed alfalfa, grown within 1.5 km of their crops. Further, researchers found that clustering many cotton fields together provided "safety in numbers" by helping to dilute the negative impact of Lygus migrating from non-cotton sources. This information helps pest managers address decades-old nagging questions about Lygus movement and will help guide them in the introduction, placement and cultivation of other crops on which Lygus reproduce.

Impact

In response to this IPM program, more than 50 percent of the region's cotton growers have changed their chemical tactics against Lygus by switching to single compounds used strategically and at appropriate rates as part of an IPM system. This has resulted in a 66 percent reduction in the number of acres receiving spray mixtures for Lygus, while increasing effective rates by about 20 percent. In 1999, growers applied the fewest number of sprays statewide against Lygus in cotton since 1993, thus reducing their costs per acre while protecting the environment. Education efforts across the border in Mexicali, Mexico have resulted in the majority of cotton growers there adopting threshold and other IPM guidelines for Lygus management.

Arizona extension entomologists have been able to teach and demonstrate to growers that single compounds are as effective or even more effective than broad-spectrum combination sprays, and that this practice helps reduce the risk of resistance in Lygus and other insects while minimizing negative impacts on beneficial insects. More growers are now aware of the specific midseason timing (thresholds) required for the control of Lygus and for providing maximum economic return. They are also aware of new information on when precisely to discontinue sprays against this pest late in the season.

Some growers reported immediate savings of $25 per acre by curtailing sprays earlier than they would have done otherwise, because research showed that they were not cost-effective. The success

of this program has led for the first time to efforts to control Lygus across multiple crops (Lygus are highly mobile and feed on several crops in addition to cotton.) Through community-wide cooperation with growers in a large agricultural region, researchers were able to collect enough information about distributions of Lygus across multiple hosts to formulate concrete recommendations for planting patterns and distances from sources. This has also led to a four-state collaboration (Arizona, Texas, New Mexico and California) among scientists and educators who plan to coordinate information and planting mixes to control Lygus more collectively over a broader area in 2006.

Funding

Hatch Act
Smith-Lever 3(d) (e.g., IPM)
Western Region IPM; Pest Management Alternatives Program
UA program enhancement (CES); UA IPM and CROP programs

Western IPM Center
UA's Arizona Pest Management Center
Cotton Incorporated, Arizona Cotton Growers Association
Agrochemical companies

NSF's Center for Integrated Pest Management

ADA's Specialty Crop Program

Arizona Cotton Research & Protection Council

Optimizing Long Distance Transportation Conditions for High Quality Tomato Seedlings

Impact Nugget

UA researchers found that lowering the transport temperature for grafted tomato seedlings to 10-12 degrees C from the conventional 18 degrees C in refrigerated trucks significantly improved the flowering and development of the initial fruit; the largest grower of greenhouse tomatoes has adopted the practice, and saved an estimated $500,000 per year, or $3,100 per acre of greenhouse tomatoes annually. There is also a significant benefit found for transplant propagators who can now extend the transportable distance of their seedlings across two borders, from Canada to Mexico.

Issue

The production of high quality transplants is a critical technology that supports the success of the final crop. Healthy transplants mature predictably and yield well. In current industry practice, transplants are produced in an operation that is separate from final crop production. This recent trend is especially popular for vegetable and floriculture crops that require special techniques, such as grafting or vegetative propagation, and facilities to produce desirable transplants.

Increasing numbers of vegetable growers are purchasing their transplants from specialized transplant producers. There is a growing nationwide interest in use of high quality grafted seedlings for greenhouse tomato production, but the source of grafted tomato seedlings is still limited in the

United States. For example, greenhouse tomato growers in Arizona must purchase grafted seedlings from Canadian propagators, thus risking deterioration of transplants during transportation. Over the past several years, abnormal fruit development has been observed for the first truss (fruit set), attributed to the rigors of long distance transportation.

Further, Arizona greenhouse tomato growers have observed that transportation conditions, coupled with the status of flower development during transportation, and planting conditions after transportation, influence flower abortion and abnormal fruit development of the first truss. Significant yield delays and losses have resulted in part because the mechanisms that cause flower drop and abnormal fruit development during long distance transportation are not well understood.

What has been done?

Environmental conditions in temperature-controlled trailers full of grafted tomato seedlings were analyzed during a regularly scheduled two-day transportation from a Canadian propagator to Arizona growers. The goal was to understand how to optimize transportation conditions to minimize or eliminate the negative impact of transportation on the transplants and thereby on the early yield. UA researchers from the Controlled Environment Agriculture center collected information from the Canadian propagator and Arizona tomato growers on the current transportation situation and associated problems to define a hypothesis for preventing flower abortion and abnormal truss development. Simulation experiments were then conducted on campus to examine combinations of air temperature and light intensity during transportation. Research found that lowering temperature is effective to keep the seedling quality, which was quickly implemented to the seedling transportation conditions to Arizona and also to Mexico.

In 2005, the UA researchers found that treating seedlings with a 1-Methylcyclopropene (1-MCP), an inhibitor of ethylene-mediated reactions and widely used for postharvest management, had an effect similar to lowering temperature inside the trailers. This finding is particularly important as application of 1-MCP may keep the seedling quality when lowering temperature is not an option.

Impact

The results show that lowering air temperature to 10-12C from the conventional 18C for transplants during transportation significantly improved the development of flower and fruits of the first truss. Based on the experimental results, the largest Arizona greenhouse tomato operation adopted transportation of the grafted tomato seedlings at lower air temperatures inside the trailers (10-12 degrees C.) Immediate analysis of transplant quality and early fruit development was conducted and normal truss development was confirmed by University of Arizona researchers. Follow-up research results show that ethylene accumulation was the primary cause of the delayed fruit development causing yield reduction by long distance transportation at an inadequate temperature. Application of 1-MCP during transportation was shown to improve the development of flower and fruits of the first truss, although lowering temperature was the most effective under the present experimental conditions.

Since this strategy has been adopted, the profit to the largest Arizona greenhouse operation by improving the transport conditions for transplants and thereby assuring normal first truss development without causing delay is roughly estimated at $500,000 per year or $3,100 per acre of

greenhouse per year. There is also a significant benefit found for transplant propagators who can now extend the transportable distance of their seedlings across two borders, from Canada to Mexico.

Funding
Hatch Act
Controlled Environment Agriculture Program (CEAC), The University of Arizona

Direct Farm Marketing and Tourism Activities: Keeping the Farm

Impact Nugget
During 2005, more 60,000 downloads of the online version of a direct farm marketing handbook were logged, including the whole book or parts of the book; the Direct Farm Marketing and Tourism Handbook is widely accessed and maintains the #1 listing for "Direct Farm Marketing" on the Google search engine (rank is based on cross-listings of the web site and sites selected by users).

Issue
For many small and medium-sized farms, traditional commodity marketing channels no longer provide sufficient returns to support a family through farming. The value-added contribution by U.S. producers of consumer food expenditures has fallen from 22.8 percent in 1950 to only 7.9 percent in 2000. By allowing farmers to retain a higher share of consumer food expenditures, direct marketing, along with agritourism, has proved to be an alternative for keeping these farms economically viable. 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. 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 members convened 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 10th annual conference was held at the Prescott College's Wolfberry Farm, located near Chino Valley Arizona in the summer of 2005. Issues related to zoning amidst urban growth and organic certification issues were addressed. The Arizona Legislature is currently considering "right to farm" legislation that may limit some of the zoning regulations that small direct marketers near and within urban fringes are facing. The event 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.

A web portal for connecting direct marketers with consumers has been developed. The site allows consumers to enter their zip code and a radius that they are willing to travel or secure the selected agricultural products from. Producers can input harvest and production calendars so that consumers can see when their most active harvest is occurring. Producers will also be able to monitor the level of requests for products that may not exist in their area.

Other publications for direct farm marketers were released in late 2004 and 2005 entitled, "Western Profiles of Innovative Agricultural Marketing: Examples from Direct Farm Marketing and Agri-Tourism Enterprises" and "Certification and Labeling Considerations for Agricultural Producers."

Impact

Participants at the direct farm marketing conference (DFMT) in 2005 not only rated the topics presented as being relevant to their operation but 84 percent reported that the information presented would likely be used as part of their business strategy in the future. Participants are excited to meet with others who are experiencing similar production and marketing challenges that go along with a direct farm marketing operation. For example, "right to farm" legislation implemented in Oregon and explained by a representative from Oregon's Department of Agriculture was used as a reference for what could benefit Arizona.

More than 3,500 and 2,800 hard copies of Western Profiles and Certification and Labeling Considerations have been distributed throughout the U.S. These publications are also available for free on the Internet and producers have been accessing the publication online. On-line access of the printed editions are available at http://cals.arizona.edu/wemc/wemc.html. More than 12,000 downloads were made during 2005 of the entire book or an article in the book. Thus, more than 30 individuals a day have been served with this publication (even after reducing downloads from robots.)

Western Profiles is "a timely topic and one that has not received a great deal of research in recent years. I applaud the authors and the WEMC for taking a look at this issue."

"The publication on third party certification and labeling requirements is one of the most thorough I have seen on this topic."

The Direct Farm Marketing Handbook is still widely accessed and maintains the #1 listing for "Direct Farm Marketing" on the Google search engine (rank is based on cross-listings of the web site and sites selected by users). Requests to utilize the handbook for a short course or class have come from other Western states in addition to Arizona, and Australia, Canada and South Africa. During 2005, over 60,000 downloads of the online version of the book were logged, including the whole book or parts of the book.

“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
Smith-Lever
Risk Management Agency, Outreach

Better Nitrogen Management in Irrigated Cotton

Impact Nugget
UA demonstration projects have shown that nitrogen fertilizer applications can be reduced with no loss in yield and benefits to the environment from reduced nitrates in the soil; if adopted statewide, the annual savings, at February 2006 nitrogen prices, would be conservatively estimated at about $23 per acre. If 200,000 acres of the total cotton acreage in Arizona were affected, this would equate to $4.6 million in savings to the growers, who would be using approximately 150 pounds per acre, compared to a more common rate of about 200 pounds per acre, a 25 percent reduction.

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 in 2001 those costs rose approximately 30 percent and more or less remained at that level through 2005.

What has been done?
To help Arizona cotton growers establish efficient nitrogen applications in their fields, University of Arizona researchers studied and documented nitrogen uptake patterns and requirements in the crop at three UA agricultural centers. At each location, treatments varied from a conservative to a more aggressive approach to nitrogen management. Results at each location revealed a strong relationship between the crop fruit retention levels and nitrogen needs for the crop. Results showed that the higher, more aggressive N application regimes did not consistently benefit yields at any location. Generally, the more conservative, feedback approach to N management provided optimum yields at all locations.

UA College of Agriculture and Life Sciences researchers have designed nitrogen management guidelines and recommendations that pinpointed the best times to apply nitrogen in the proper amounts. Over the last 19 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 2006 nitrogen prices, would be conservatively estimated at about $23 per acre. If 200,000 acres of the total cotton acreage in Arizona were affected, this would equate to $4.6 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

Low input barley

Impact Nugget

Grain yield of low input barley is about half that of high input barley, but it requires only a third of the irrigation water and a quarter of the fertilizer. The potential savings by growing low input barley is about 2 acre-ft per acre of water and 150 pounds of nitrogen fertilizer per acre grown.

Issue

Barley is an important component of the crop mixture in Arizona. It improves the soil and breaks pest cycles, and thus benefits subsequent crops such as cotton and vegetables. Growers wish to recover their production costs when growing barley. This has become more difficult with the rising costs of inputs such as irrigation water and fertilizer.

What has been done?

University of Arizona researchers have evaluated low input barley varieties at the Maricopa Agricultural Center for the past 5 years.

Impact

Grain yield of low input barley is about half that of high input barley, but it requires only a third of the irrigation water and a quarter of the fertilizer. Therefore, if water and fertilizer costs are high, growing low input barley can be more economical. The potential savings by growing low input barley is about 2 acre-ft per acre of water and 150 pounds of nitrogen fertilizer per acre grown.

A low input barley cultivar named Solar will be released in 2006. This cultivar was identified from evaluations at the Maricopa Agricultural Center. Compared with Solum, a low input barley released in 1991, Solar has 10 percent higher grain yield, 11percent higher grain test weight, and 24 percent less lodging.

Funding

Arizona Grain Research and Promotion Council
Smith-Lever

Goal 2: *Safe and secure food and fiber systems*

Aquaculture Pathology Laboratory Assists Shrimp Industry

Nugget Statement

The UA's Aquaculture Pathology Laboratory has served the domestic and international shrimp farming industry for 30 years by developing diagnostic methods for control and prevention of shrimp diseases; by being part of the team that produced the first domestic pathogen-free stocks of the Pacific white shrimp that has become the dominant shrimp variety cultivated worldwide; by training more than 1,000 national and international shrimp disease specialists; and by identifying new shrimp pathogens and diseases. The APL has helped form the basis of the commercial shrimp industry, from its experimental beginnings in the 1970s to the multi-billion dollar business that it is today.

Issue

Large-scale commercial farming of shrimp is a relatively young and rapidly growing industry that began only 30 years ago, and now more than half of the world supply comes from farms. Most of the farmed shrimp production is imported by the United States, Japan and Western Europe. As the industry has grown, some very significant shrimp diseases have emerged and spread rapidly in the industry, often resulting in severe epizootics in some shrimp growing countries. Global crop losses since 1992 from two shrimp virus pandemics now exceed several billion dollars.

What has been done?

The Aquaculture Pathology Laboratory (APL) in the University of Arizona College of Agriculture and Life Sciences focuses on diagnosing and researching shrimp diseases, and on training others in shrimp disease diagnostic methods. Among APL's goals 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 improving on-farm, regional or national biosecurity, as well as developing domesticated specific pathogen-free or specific pathogen-resistant shrimp stocks.

Transfer of the technologies developed by the APL has been accomplished through the publication of its research findings and methods in the professional literature, by presentations at international conferences, and by the teaching of its annual summer session shrimp pathology short course and special shrimp disease workshops in host countries. Seventeen regular summer session short courses have been given on the University of Arizona campus since the first was offered in 1989, and some 476 students from 53 countries or territories have been trained in diagnostic shrimp pathology in these courses. When the students from the more than 20 special workshops given abroad are added to the regular short course total, some 1,019 students had received formal training in shrimp pathology and diagnostic methods from the APL as of December 2005.

The program includes a laboratory and a primary quarantine facility which acquires wild or farmed shrimp and assesses the disease status of these stocks prior to their being introduced into domestic shrimp breeding programs. The laboratory was designated by the Office of International Epizootics (OIE) in 1993 as one of only two reference laboratories in the world for penaeid shrimp disease, and it subsequently became a USDA APHIS Approved Laboratory for shrimp diseases. 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.

Impact

The APL at the University of Arizona in Tucson has served the domestic and international shrimp farming industries for more than 30 years. It has helped form the basis for an industry that has grown from its experimental beginnings in the 1970s to the multi-billion dollar business that it is today.

Much of what is known about shrimp diseases and the methods to diagnose and manage them were developed here. There are many hundreds of shrimp disease specialists working with the shrimp farming industry today, and many of these received much of their training directly or indirectly from the APL, including many of the 1,019 who participated in APL courses and workshops.

The APL remains a leader in shrimp disease research and in the past 1-3 years APL identified, characterized and named two new diseases from penaeid shrimp, as well as demonstrating that TSV, a shrimp picorna-like virus, is not a zoonotic threat to humans as had been incorrectly reported to the CDC by another research group. Of the two new diseases, Infectious Myonecrosis was found to be caused by a toti-like virus appropriately named IMNV. This disease caused more than $20 million in lost production in 2003, and another more than $40 million in 2004-2005, to Brazilian shrimp farmers. Because it poses a significant threat to shrimp farming worldwide, IMNV is a candidate for disease listing by the OIE. The second new disease was spiroplasmosis, a presumably new and very interesting disease of farmed shrimp that broke out first in shrimp farms in Colombia. APL has named the causative agent *Spiroplasma penaei*.

The APL also conducted the primary quarantine on stocks of Pacific white shrimp in Tucson, producing the founder populations of pathogen-free stock that were later propagated and distributed by the Oceanic Institute in Hawaii to domestic broodstock producers and eventually to commercial shrimp farmers throughout the world. The Pacific white shrimp variety has since become the dominant shrimp variety farmed worldwide.

Funding

Special research grants and contracts from the U.S. and international shrimp farming industry
Other CSREES: USDA Marine Shrimp Culture Consortium
Hatch Act

Goal 3: *Healthy, well-nourished population*

Bone Builders Program Fights Osteoporosis

Impact Nugget
The collaborative Bone Builders osteoporosis prevention program focuses on education and screening: in 2005 Bone Builders partners screened 98 women with ultrasound technology on a volunteer basis; one million people were reached with education, materials, displays and media; and the Web site www.bonebuilders.org had 12,801 visitors, with 432,623 hits or 30 visitors per day with an average of 30 hits per visit.

Issue
It is estimated that one out of every two women over 50 will develop osteoporosis. Older men have also been identified as possibly at risk. This silent disease weakens bones, eventually causing fractures, disability and loss of quality of life for millions of people, especially the elderly. It is the number two reason for women's admissions into nursing homes. More than 28 million Americans who have osteoporosis or at high risk because of low bone mass; 80 percent of those affected are women. Although osteoporosis is both treatable and preventable, studies show that awareness is quite low among the U.S. population. Simple changes in diet and exercise can improve calcium levels in the body and strengthen bones before osteoporosis occurs. With the large baby boom generation now moving into the beginning life stage susceptible to osteoporosis, education and prevention is more important than ever.

What has been done?
A collaborative program called “Bone Builders” was developed as part of the University of Arizona partnership between Cooperative Extension in the College of Agriculture and Life Sciences and the UA College of Public Health. The program brings together several public and private partners to reduce risk for osteoporosis statewide among women over 25 and men over 65 by increasing their awareness of the risks of osteoporosis and ways to prevent it from developing. The program recruits and retains community peer educators who teach local, community classes, and seeks to identify high risk women in each community and encourage them to get basic x-ray or ultrasound screening for bone density. In fall 2001, new funding allowed Bone Builders to concentrate more time teaching food stamp-eligible women.

Since 1998, more than 320 volunteers and staff have been trained. Bone Builders displays were featured at health fairs, community fairs, health spas, statewide conferences and community libraries. The Web site, www.bonebuilders.org, was developed. The Bone Builders program received the Preister Extension Health Award in April 2003 from USDA-CSREES. A Bone Builders senior physical activity program was begun for inactive seniors in Tucson and Phoenix and at 10 senior centers in 2003, and received a special award from the City of Phoenix that year. This nine-week program continues with grant funding at more than 15 centers in Buckeye, Tempe, Springerville, Phoenix and Tucson senior centers with more than 250 participants in 2005.

Impact
In 2005 Bone Builders programs taught 4335 people at 305 classes; another 220 were taught one-on-one, and 16,445 were instructed at 66 health fairs. One million total were reached with education, materials, displays and media. Bone Builders partners screened 98 women. A sample

of 1513 class participants rated their classes as 4.5 out of a 5-point schedule with 5 as excellent. BoneBuilders.org had 12,801 visitors in 2005 with 432,623 hits or 30 visitors per day with an average of 30 hits per visit.

Participants report major improvements in daily functioning, energy levels, strength and endurance: A sample of 481 participants sampled statewide in 2004 rated their knowledge before a Bone Builders class as 1.88 and 4.65 out of 5 after the class—a 140 percent increase in knowledge. From a statewide sample of 211 community class participants, 79 percent reported they intended to make changes as a result of the class. When called 4-6 months later, 39 percent said they actually increased their calcium consumption as a result of the classes; 36 percent had increased their weight-bearing exercise, and 22 percent went on to get a bone density scan because of attending the class. All seniors completing the BBPAP class improved in at least 1 out of 6 fitness assessments. Two volunteers (married 50 years) reported major improvements in overall health, morale and involvement in their center due to the series.

Funding

Smith-Lever
UA College of Public Health
County Department of Public Health Services
Dairy Council of Arizona
Arizona Department of Agriculture
Arizona Osteoporosis Coalition
Scottsdale Health Care
Phoenix Center for Clinical Research
Arizona Department of Health Services
Arizona Nutrition Network

EFNEP Knowledge is Power–Nutrition Education for Healthier Families

Impact Nugget

EFNEP nutrition educators in Maricopa County (including the Phoenix metropolitan area) taught 2,000 families in 2005; reports show that 95 percent of the participants exited the program with positive overall changes in any food group such as consuming more fruits and vegetables and decreasing sugar and fat intake. The total number of participants who completed a six-week session in 2005 was 2,132.

Issue

Hunger and poor health contributes to debilitating factors such as increased chronic disease, homelessness, family stress and deterioration, and child health related diseases due to inadequate nutrition. The Native American reservations are combating diabetes at an alarming rate and the African American and Hispanic communities are struggling with diabetes and high blood pressure. Americans as a whole are faced with the same nutrition related problems. Proper nutrition plays a major role in combating food related diseases.

What has been done?

EFNEP, the Extension Food and Nutrition Education Program strengthens low-income families through education. Families learn about making sound nutritional choices based on dietary guidelines, by improving their overall nutrition and health, and learning skills to manage their money through optimum grocery purchasing and applying safe food practices.

Education regarding the positive effects of healthy food choices gives families the power to decrease the negative effects of poor food choices. Thus EFNEP classes stress positive choices, such as increasing consumption of fruits and vegetables and decreasing the negative effects of poor food choices high in fat, sugar and salt.

EFNEP nutrition educators in Maricopa County (including the Phoenix metropolitan area) taught 2,132 six lesson each for a total of 13,622 contacts in 2005. The number of households enrolled in one or more food assistance programs as a result of EFNEP assistance was over 1,400 households. Simple money-management techniques taught in EFNEP classes empowered families to use food dollars more wisely and make healthier food decisions.

Impact
In 2005, ninety-five percent of the 2,132 participants exited the EFNEP program with a positive overall change in any food group such as consuming more fruits and vegetables and decreasing sugar and fat intake. Eighty-one percent of EFNEP participants showed improvement in planning meals, in not running out of food before the end of the month, in comparing prices and in using grocery lists when shopping. Seventy-nine percent of EFNEP participants ate two or more servings of fruit and 64 percent were eating three or more servings of vegetables upon exiting the program. Seventy-eight percent of EFNEP participants showed improvement in one or more nutrition practices such as preparing food without adding salt.

Funding
Smith-Lever 3 (d): EFNEP
In-kind from agencies

Walk Across Arizona–Exercise Program for Seniors

Impact Nugget
Statewide, 219 Walk Across Arizona teams reported walking 343,858 miles, an increase of 201 percent in miles walked compared to 2004. Participants walked an average 11.5 miles per person and 98 miles per team per week.

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 small 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 16-week campaign for 2005-2006 involves Maricopa, Pima Graham, Greenlee, Pinal, Yavapai and Yuma counties. Each county has a link on the Walk Across Arizona site, http://www.cals.arizona.edu/walkacrossaz, where team captains can access forms and county coordinators can record weekly miles and update local activities.

Impact

In 2001, 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.

By 2005, a total of 1,908 people had registered for the program, with 831 or 45 percent completing exit forms. This number was more than double the number of people completing the program in 2001. Statewide, 219 teams reported walking 343,858 miles, an increase of 201 percent in miles walked and an increase of 242 percent in the number of teams formed compared to 2004. Participants walked an average 11.5 miles per person and 98 miles per team per week. Anecdotal responses from the completed final exit forms included 48 percent responding that “Walk Across Arizona increase the amount of exercise I was already doing;” 43 percent reported that it “increased my energy” and 39 percent said it “helped me feel less stressed.”

Testimonials:

At one retirement community, the team captain is 94 years of age, the oldest participant in the program. At the same retirement community, 83-year-old identical twin sisters walk an average 16 miles per week. "We love to exercise, but it isn't to try to live to be 100," says one of the twins. "We just want good quality of life."

"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
Cooperative Extension - Community Health Advancement Partnership
Participant fees
20 Community collaborators/sponsors

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

School IPM: Children's Environmental Health Program

Nugget Statement
Integrated pest management programs implemented in one Arizona school district resulted in a 90 percent reduction in applied pesticides, maintaining pest populations at 85 percent below their previous levels and costing no more than traditional programs.

Issue
Many 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 often fails to work. Unacceptable pest populations remain a problem in these schools. At the same time, while the pesticides are applied and reapplied, parents pull their children out of school for a day or two each month to avoid pesticide exposure.

What has been done?
An integrated pest management program (IPM) for schools in Arizona began in 2000 and has continued to expand for the past five years. It is now part of a national and international environmental health effort connecting school districts in Arizona, Florida, Alabama, Ohio, Indiana, Utah, Washington, and Sonora, Mexico.

Three schools in the Kyrene School District in metropolitan Phoenix were chosen for a pilot IPM project in 2000 to control pests while avoiding reliance on chemical pesticides. A team of specialists, including University of Arizona entomologists, designed a program based on the Monroe IPM Model, originally developed by Indiana University professor Marc Lame. The schools concentrated their efforts (and capital resources) on identifying the pests, finding where they came from, and preventing their entry into buildings. The custodial and kitchen staffs also were mobilized to learn how to discourage pests. All of the openings around pipes and conduits were sealed, crawl spaces closed off, and drains and building slabs 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 Kyrene School District, observing the benefits of a good IPM program, adopted the IPM philosophy and received STAR Certification (National IPM Institute) for practicing a great program district-wide.

In 2001 a 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. Although the program was going to expand to include all the BIA schools on the Navajo, Hopi and south Pueblo reservations, BIA discontinued program support and sponsorship in 2003. Sadly, Navajo and south Pueblo schools reverted back to regular spraying. New pilot programs subsequently began on the Gila River Indian Reservation and Hopi Reservation in fall 2002. One school had spent nearly $7,000 in pest control annually until the school IPM program brought the cost down to a few hundred dollars instead.

The School IPM program continues to grow: UA faculty have partnered with the Arizona Department of Environmental Quality, the Arizona Department of Health Services, Arizona/Sonora Commission, Arizona Asthma Coalition, EPA Region 9, National IPM Institute, International Urban IPM Association, Environmental Strategic Alliance entities, ASU, the Navajo Housing Authority, and Phoenix Children’s Hospital.

In 2003 UA faculty formed a Valley Metro School Coalition dedicated to implementing IPM in member schools. Throughout 2003-05, the program expanded to include 10 school districts in the Phoenix metropolitan area, plus the Salt River Pima-Maricopa Indian Community and the Hopi Reservation schools. A program was established in Tucson Unified School District and in the Nogales Arizona/Sonora border area. The Arizona/Sonora Commission plans to expand IPM to all schools in Sonora, Mexico, showcasing the model process along the border regions.

Indoor Air Quality technologies are now introduced to all participants involved in the IPM Coalition, making this a broader Children's Environmental Health Program. Child care facilities and support entities are now also joining the coalition. Child care supporters include UA faculty, Arizona Department of Health Services Breath Mobile participants and pediatric asthma specialists from the Phoenix Children's Hospital. The latter are conducting studies on the prospective health benefits of school IPM programs by monitoring students with asthma. The study involves a school district with the highest frequency of asthma attacks resulting in emergency room visits in the state. Asthma triggers include certain pest allergens, such as cockroaches, and types of pesticides. Schools that are on IPM programs not only have fewer cockroaches, but also less pesticide in the environment.

Impact

The IPM final evaluation for the Kyrene School District showed that the three Phoenix schools reduced their pesticide applications by 90 percent and kept pest populations below 85 percent of their original levels. The costs associated with IPM were no more than a traditional program.

Considering the larger Arizona perspective, there are 216 state school districts in Arizona, with a total enrollment, as of September 2005, of 1,011,959 students. So far, 303,600 of these students are in school districts that practice IPM–32 percent of the Arizona public school enrollment.

These successes have resulted in a unique coalition project launched with Arizona Department of Environmental Quality, Public Health, EPA Region 9, the UA, Structural Pest Control Commission and the National IPM in Schools team. The ultimate goal is statewide implementation of school IPM practices. The Arizona state program for IPM in schools has become a model for developing children's environmental health programs in schools across the United States.

Funding

University of Arizona Cooperative Extension
Environmental Protection Agency

Conserving Water with Water Wise

Nugget Statement
Cochise County's Water Wise program focuses on community water conservation measures; audits of commercial facilities in 2005 resulted in a combined potential savings of more than 15.7 acre-feet of water (325, 851 gallons). A quantitative water conservation program held for 200 students yielded an average weekly savings of 57 gallons of water per student after the program.

Issue
The Sierra Vista Sub-watershed, located in the southeast corner of Arizona, includes seven municipalities and few unincorporated areas with a combined population of approximately 70,000 residents. Sub-watershed residents rely on an aquifer for all their water needs. The sub-watershed is drained by the San Pedro River, recognized as the first national riparian area by US Congress in 1988 because of its rich diversity of plant and animal species. This riparian area is dependent on the height of the aquifer. Unfortunately, like many areas in the Southwest, the aquifer is being overdrawn by the increasing human population of the sub-watershed. This overdraft threatens the health of the riparian area. Additionally, other Cochise County communities are reliant on groundwater and are experiencing increasing demands on limited water supplies.

What has been done?
Responding to the need for conservation in the Sierra Vista Sub-watershed, Cochise County Cooperative Extension began an effort in 1994 in coordination with the City of Sierra Vista, local water companies and utilities that eventually resulted in the development of Water Wise. Supported by private and public sponsors, this community education program now reaches out to all Cochise County residents helping them reduce water use and implement good natural resources management practices on their land and/or in their businesses. One of the goals of the program is to make water conservation a community value.

Water Wise provides free information through bulletins, information racks, a hot-line telephone service, speakers, community presentations, workshops, educational events and on-site water consultations. Water Wise Youth, Energy Smart program (WWES), and the Plant Sciences Center are other programs administered by Water Wise. They emphasize water conservation for students, for residents of the nearby military base Fort Huachuca, and promote low water use native vegetation in landscapes, respectively. Auditors perform residential, industrial, commercial and institutional property audits. With this data, the Water Wise program can chart water use trends, identify abnormal spikes in use and assist the auditee with conservation methods.

Of the four entities working with water conservation within the Sierra Vista Sub-watershed, Water Wise is the only organization whose primary focus is educational. The three other entities: the Upper San Pedro Partnership, Cochise County Water Conservation Office, the city of Sierra Vistas Water Tight program, focus on policy and rebate programs. Water Wise assists with these efforts.

Impact

During 2005, Water Wise facilitators reached 2,604 residents, 3,380 students, and 4,287 military and civilian personnel directly through workshops, classes, presentations, displays, tours and other activities. Groups ranged in age from school children to adults. Direct and indirect contacts throughout the target area in the County totaled over 70,000 people. Residential audits reached 250 direct contacts and 108 indirect contacts. A survey taken of residential auditees who had a water history at their residence at the time of the audit, indicated that 85 percent thought that their water use was reduced as a result of the visit. For those who didn't have a water history, 88 percent thought that their water use was less than it would have been as a result of the visit.

Over 400 attended the Water Wise Rainwater Harvesting and Xeriscape Tours. 1,208 people attended the 19 Water Wise presentations, classes and workshops. The Water Wise mailing list of 700 direct contacts, receive water conserving announcements and quarterly newsletters. The WWES program's outreach activities included 52 public outreach/education events with 2,195 direct and 2,092 indirect contacts.

Water Wise was responsible for 81 media outreach activities in 2005 that featured the program: 70 articles to four major county newspapers and a contractor's newspaper with a collective readership of over 48,000; five radio programs; one television program, 3 city bus signs and 3 movie advertisement slides.

Industrial, commercial and institutional audits comprised of 65 facilities were conducted by the ICI and WWES program. Some of those audits resulted in a combined potential savings of more than 15.7 acre-feet of water (an acre foot is 325, 851 gallons). The amount of water potentially saved from the remaining audits could not be quantified. Documentation of water savings within this sector can be measured with a caveat: the audit report can only quantify potential savings. Due to labor shortages and replacement costs, many water saving recommendations from the audit are not immediately achievable. The ICI sector also assists the governmental Cochise County Conservation Program by visiting recipients of their toilet replacement program. Approximately 50 percent of the 48 visits needed to have the float level adjusted to keep their new toilets from leaking water.

The Water Wise Youth and WWES Programs conducted 155 classroom presentations reaching 3,380 students and indirectly reached over 6,000 family members. The program also held its second Water Festival with 464 fourth grade students participating in three educational activities. The program also conducted a Thirsty Lizard quantitative water conservation program with 200 student participants. Average weekly savings of 57 gallons of water per student occurred after the week-long special program.

In 2004 the City of Sierra Vista Public Works Department reported city wide water savings of 93 million gallons (285 acre feet), a savings of approximately 4 percent compared to 2003. The Water Wise Program has been credited as one of the organizations contributing to this savings. Ft. Huachuca (U.S. Army)) was recognized for reducing water consumption by 42 million gallons (7.5 percent) over FY01, with the Water Wise and Energy Smart program recognized as an

important contributor to the Fort's success. Figures for 2005 are pending.

Water Wise has been recognized by a consortium of 21 federal, state, county, city and stakeholder organizations - called the Upper San Pedro Partnership- as the educational outreach program for community water conservation.

Testimonials:

"My wife and I are indeed appreciative of the time and effort you and the Water Wise partners and sponsors have put forth. We have been more aware of our water use because of your help. We hope more people use your service; the whole community will benefit greatly."

"I so enjoyed your visit as well as benefitted from it. I've pored over the materials you left. Much thanks again."

The WWES educators received a personal communication from Colonel Hunter, the Ft. Huachuca Garrison Commander, praising the program and stating that the has asked staff to work on developing a plan to leverage the WWES Program to higher-level commanders to increase the current successful water conservation efforts.

Funding
Cochise County, City of Sierra Vista, Fort Huachuca, Upper San Pedro Partnership, Bella Vista Water Company, Arizona Water Company, Pueblo del Sol Water Company, Sulphur Springs Valley Electric Cooperative, Southeast Arizona Association of Realtors.

Saving Energy Costs with Operation Cool Shade

Impact Nugget
By planting shade trees around their homes, 442 homeowners in Pima County, Arizona collectively saved a projected $61,663 in electrical costs during the peak summer months in 2005. More than 1,300 trees were distributed to these electric cooperative customers. Since 2000, a total of 9,258 trees have been distributed to 3,231 customers in Pima County.

Issue
Studies show that proper shading of the home can reduce energy consumption by as much as 20 percent. "Operation Cool Shade" began in 2000 when 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. Master Gardeners completed "train the trainer" programs and in turn trained residents regarding the correct selection, placement, planting and care of shade trees.

In 2005 eight Master Gardener volunteers conducted four annual programs, two in Green Valley and two in Marana, for 185 participants. 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, Arizona. 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
During 2005 Operation Cool Shade program, 1,314 trees were distributed to 442 electric cooperative customers. Since 2000, a total of 9,258 trees have been distributed to 3,231 customers in Pima County, Arizona.

Given the average peak household consumption (July, August and September) of 7,263 kilowatt hours and the current rate of $0.09602 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 $139.51 during that time. In terms of all 442 participating households for 2004, the projected savings is 642,226 kWh or $61,663 for the peak three-month summer period.

Funding
TriCo Electric Cooperative
Smith-Lever

Goal 5: *Economic development and quality of life for people and communities*

Arizona 4-H Character Counts: Educating Cochise County Youth

Impact Nugget
Nearly 200 youth at Ft. Huachuca army installation participate in Character Counts education at the Ft. Huachuca Accommodation School. Arizona now leads the nation in collaboration between 4-H faculty and military installations as evidenced by the invitation to be the state-side sponsor of Air Force Bases in Korea and Japan.

Issue
4-H Agents have identified character issues as critical in many 4-H activities. Also, schools report that disruptions in the classroom due to behavior problems reduce the number of effective teaching hours in a school day. The need was identified to improve behaviors in some youth and train agents, teachers and community leaders using Character Education materials and resources.

What has been done?
Character Counts Curriculum is now in all five of the elementary schools and in both of the middle schools in the Sierra Vista Public School District in southeastern Arizona. Cooperative Extension personnel in Cochise County provided Character Counts training to care providers who serve all five of the before-and-after-school sites at the elementary schools. Character Counts training was also provided to the Boys and Girls Clubs of America in Sierra Vista and Bisbee. Sierra Vista continues as a "Community of Character" and has extended and endorsed Character Counts throughout the community. At Apache Middle School, the six pillars painted upon the pillars of their locker ramada as a daily reminder that these six pillars are the pillars of the school.

School children are learning to become leaders instead of displaying negative behavior. Smith Middle School has adopted the Character Counts program. Douglas educators have attended training and Sam Gordon Elementary school has also adopted the program. Bisbee's homeless shelter for women and their children use the curriculum and have started a 4-H club at their site. One trainer at the Sierra Vista Boys & Girls Club of America stated, "We couldn't imagine NOT having the six pillars of character be the foundation of our program. It is fun, easy, and just makes sense."

In 2005, 17 juvenile detention staff were trained in Character Counts for comprehensive implementation at the Sierra Vista facility. Twenty-five teachers at Chancellor charter school were also trained.

Impact
Nearly 200 youth at Ft. Huachuca receive Character Counts education at Ft. Huachuca Accommodation School. There is full implementation of Character Counts at the Child Development Center. Chancellor Charter School fully implemented Character Counts in 2005, serving about 400 youth. In addition, 12 providers from the Sierra Vista Parks and Leisure KIDS world program completed Character Counts training for full implementation serving more than 300 youth five days a week.

Arizona now leads the nation in collaboration between 4-H faculty and military installations as evidenced by the invitation to be the state-side sponsor of Air Force Bases in Korea and Japan. During the ribbon cutting ceremony for the new School Age Services building, Congressman Jim Kolbe commented, "It is great to see 4-H all over this building. I never realized the Army was involved in 4-H."

Funding
Arizona Cooperative Extension
Smith-Lever

PHASE Program: Project for Homemakers in Arizona Seeking Employment

Impact Nugget

The Project for Homemakers in Arizona Seeking Employment (PHASE) has an 84 percent training and/or job placement rate. PHASE has assisted more than 9,500 women in Pima County since 1978. Among the incarcerated women who have taken the program before being released, there has been only an eight percent rate of recidivism.

Issue
Women with barriers to employment include single parents, displaced homemakers, incarcerated and offender women, and women with substance abuse issues. They often don't know where to begin in finishing their education, finding a job, and building a career in general. As the economy continues to tighten, there is a greater need than ever before for strategies to assist people in moving from government dependency to self-sufficiency.

What has been done?
The PHASE program (The Project for Homemakers in Arizona Seeking Employment) began in 1978 to assist low income women with their job search. The program provides career assessment; job search and nontraditional employment workshops; pre-apprenticeship training in highway

construction; classes in basic and advanced computer skills and keyboarding; assistance with education/training; and job placement and retention assistance.

Impact
Federal and local funders have recognized the importance of this program, which has an 84 percent training and/or job placement rate. It has become a national model for similar programs throughout the U.S. PHASE has assisted more than 9,500 women in Pima County since 1978. Men comprise about seven percent of the total number of clients served.

Legislation enacted five years ago has allowed PHASE to add other special populations including incarcerated women and female ex-offenders. PHASE staff actually go into the local Southern Arizona Correctional Release Center (SACRC) and the Pima County Jail to provide job readiness skills to those women who are within 30 to 60 days of being released. Based on a year's follow-up, there is less than an eight percent recidivism rate for female offenders in the program.

"…you understand that people make mistakes…thank you for your time you invested, trust me you did not waste it; I learned something every day." –Participant, PHASE Pima County Jail Job Search Workshop

"Workshop was very helpful to me. I'm glad to learn this service was available for individuals who need this type of computer skills. Just seeing a flyer at One-Stop, I've brushed up on my computer skills. All who came and gave us information were good and informative." –Participant, PHASE Computer Skills Workshop

Funding
Pima County Community Services (Workforce Investment Act dollars); U.S. Department of Labor; Prisoner Re-entry Initiative; Arizona Department of Education; Arizona Governor's Office for Children, Youth and Families, Women's Division; School of Family and Consumer Sciences, UA College of Agriculture and Life Sciences; The West, Resource Exchange; Community donors

Grandparents Raising Grandchildren

Impact Nugget
Arizona Cooperative Extension collaborates with other agencies in Arizona to offer assistance to grandparents raising grandchildren. In 2005, Pima County's Kinship Adoption Resource Education Family Center received 2,080 new contacts from local grandparents, 705 kin caregivers participated in support groups in Pima County, and the center became a model for other communities nationwide. Skill building activities for children being raised by grandparents were added this year with 368 children reached with the 4-H Challenge Program. Coconino County increased support groups by 33 percent, finalized the first of its kind Simulation Workshop, and revised programming to reach 1700 grandparents.

Issue
One in 10 grandparents has been the primary support of a grandchild at some time in his or her life. In Arizona, seven 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, 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 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 Manuals, annual conferences, support groups, mentoring programs and activities initiated at various kinship programs throughout Arizona.

Early coalition efforts included the development of resource notebooks containing information and community resources available on support groups, legal and financial issues, childcare and school support, parenting tips, and nutrition and health issues. Notebooks were distributed free throughout the community and are now available on the Web site: www.cals.arizona.edu/grandparents. During 2005, the Web site was revised to show program outreach efforts divided into northern, central and southern regions, to better serve grandparents raising grandchildren throughout the state.

The GRGSoAZ coalition actively interacts with the Maricopa County Grandparents Raising Grandchildren Coalition (GRGC) that comprises 15 agencies. The Maricopa coalition was formed to identify gaps in addressing the needs of grandparents raising grandchildren. The Maricopa Extension office has focused programming on South and Central Phoenix areas with specific emphasis on limited-resource families and minority populations. The Maricopa County Grandparents Raising Grandchildren Coalition in collaboration with Casey Family Programs, Arizona's Children and Center D.O.A.R. participated in a needs assessment process facilitated by the Institute for Cultural Affairs.

In 2002, Coconino County Extension in collaboration with Northern Arizona Gerontology Association formed a support group for GRG and established an ethnically diverse 25-member advisory committee, Kinship Kare of Northern Arizona (KKONA), to identify critical needs and develop a vision to provide better services for kin caregivers in Northern Arizona. Since the initial formation, efforts have been refocused to emphasize: the expansion of culturally competent grandparent peer leadership, teaching grandparents to navigate services and to build healthy families. In Pima County, the strategic plan for GRG was revised in 2005 with funding received from a Community Services Block Grant to augment outreach activities with Capacity Building Training for Agency Personnel using the Coconino County Simulation Workshop Model and Skill Building Activities for Grandchildren with the 4-H Challenge Program activities.

Three annual GRG Conferences were held in 2005 for northern, central, and southern Arizona.

Impact

The number of support groups in Arizona for grandparents raising grandchildren has increased from one in early 2000 to 21 in 2002, and to 32 in 2005 (Pima County has 14 groups, Maricopa 11, Mohave 1, Coconino 5, and Cochise 1).

In Pima County, the Kinship Adoption Resource Education (K.A.R.E.) Family Center, a One-Stop-Shop, has become a model for other communities nationwide. K.A.R.E. is a collaboration of Arizona's Children Association, Casey Family Programs, Pima Council on Aging, the UA Cooperative Extension and other community partners in Southern Arizona. During 2005 the

K.A.R.E. Center received 2,080 new contacts from local grandparents, and 705 kin caregivers participated in support groups in Pima County. Over the past four years, through leveraged funding and community collaboration, 800 GRG community resource manuals were assembled and distributed to grandparents raising their grandchildren.

Also in 2004-2005, Maricopa County Extension provided direct outreach to 137 grandparents raising grandchildren through support groups, conference and one-to-one mentoring. Coconino County reached 943 caregivers and community residents through direct contact at family social events, wellness sessions, school teas and other venues. A visiting scholar submitted KKONA as a model program to the Koerber Foundation in Germany. Sixty-three percent of agency participants in the Simulation Workshop in Flagstaff responded favorably to the process in the workshop to identify acts they could take as agency personnel that indicate attitude change and awareness of needed system change.

Testimonials:

"A support group participant in Cameron said, "I gave up trying to find the birth certificate for my granddaughter until you came here and gave me the push to continue."

“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
Smith-Lever
Arizona Cooperative Extension
More than 60 community agencies
Community Services Block Grants
Brookdale Foundation

Credit Management for College Students

Impact Nugget
In 2004-5, the Credit Wise Cats, gave 77 money management workshops and counseling to over 1,200 college students, public school students, and community groups. Forty eight percent reported an increase in knowledge of credit and debt management, 82 percent plan to control spending, and 88 percent intend to reduce their debt. The Credit-Wise Cats were able to influence a large audience and provide a great deal of information to a very vulnerable group.

Issue
According to the July, 2002 Nellie Mae study, Undergraduate Students and Credit Cards: An Analysis of Usage Rates and Trends, 83 percent of undergraduates attending four-year institutions possess at least one credit card. Credit card companies frequently market their products to students and credit is readily available to students at The University of Arizona, resulting in a rise in personal debt. Undergraduates in the 2000 Nellie Mae analysis carried an average credit card balance of $2,748, up from an average of $1,879 in the 1998 study. According to the 2002-2003 Student Financial Aid Report, published by the Arizona Board of Regents, 45 percent of all

undergraduates graduate with and average student loan debt of $16,943. Little is done to provide students with personal financial education to ensure that the students have the basic money management skills necessary to manage their debt and credit wisely.

What has been done?

It is obvious that student loan debt and credit problems for college students are serious issues that will only get worse. To provide assistance to those already in trouble and to prevent others from following in the same path, the Take Charge America Institute for Consumer Financial Education and Research (TCAI) was established in the School of Family and Consumer Sciences in 2003 with a $10 million endowment from Take Charge America in Phoenix, Arizona. The mission of TCAI is to bring financial information to students and families in Arizona and across the nation. To support student outreach TCAI funds the Credit-Wise Cats program as part of the Students in Free Enterprise (SIFE) Team. Credit-Wise Cats (named after the University of Arizona Wildcats) was created to provide financial education to University of Arizona students and faculty. This project was started through the SIFE Team and today includes workshops, one-on-one counseling, regional and national personal finance case study competitions, and a general education personal finance class at the university. Three main components include:

Credit-Wise Cats Educational Workshops

In the 2004-2005 school year, the Credit-Wise Cats program goal was to educate students on the wise use of credit as well as overall good budgeting and money management skills. This task was accomplished by providing faculty and students the opportunity to attend informational workshops on credit and debt management, saving, investing, and insurance. Ten students were trained as Credit-Wise Cats in the area of personal finance. After passing a rigorous proficiency test, the Credit-Wise Cats presented their workshops to classes, clubs, residence halls, libraries, public schools (K-12), and community groups. Through the course of the school year Credit-Wise Cats met with more than 1200 students through 77 workshops and one-on-one counseling sessions.

Duel in the Desert national case study competition

This sponsored project, funded by Take Charge America, a debt management agency in Phoenix Arizona, consisted of twelve regional personal finance case study competitions held at Arizona State, Boston College, Colorado State/Metro State, Drury, Marshall, St. Cloud State, University of Nevada-Reno, University of North Carolina, University of South Carolina, University of Utah, University of Wisconsin, and Purdue University. The winning school and the host school from these regional competitions compete in the national Duel in the Desert held in Tucson, Arizona every March. Teams from 24 schools solve a complex personal finance case study involving a family in Tucson facing serious financial issues. The teams are given 36 hours to develop their solution and then have 19 minutes to present their solution to a panel of expert judges. Between the regional and national “duels,” more than $124,000 in prize money is awarded through support and sponsorships by Take Charge America, Chase Bank, Wells Fargo, and the Take Charge America Institute at the University of Arizona.

Personal Finance General Education Course

In fall 2004 a "Money, Consumers and Society" course was offered for the first time as part of the general education curriculum and continues to be offered during the Spring and Summer semesters and also on-line.

Impact

Students participating in Credit Wise Cats activities during 2004-2005 reported a 48 percent increase in knowledge of credit and debt management; 82 percent plan to control spending and 88 percent intend to reduce their debt. Credit-Wise Cats were able to influence a large audience and provide a great deal of information to a very vulnerable group: 1,200 people were directly reached

in 2004-2005 through informational workshops, one-on-one conferences, and a Consumer Issues course. Credit Wise Cats were also very successful through the media. The program was featured in articles in major local, statewide, and national newspapers, magazines, and television with a population reach of more than 2,554,000.

Testimonials:

"This program has helped me better understand the choices I have with my spending."

"I never realized the importance of a credit report before I attended one of these sessions. I am going to order my report as soon as I get home!"

"I have been one of the counselors for three years and I have learned so much about my own habits. It has been very valuable."

Funding
Take Charge America in Phoenix, Arizona
Arizona Cooperative Extension

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. Third, 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 Natural Resources and Family and Consumer Sciences 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. This information is entered into 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. This data base is accessible at http://ag.arizona.edu/APROL. Public impact statements are available under the “Arizona Delivers” label, a new attempt at branding for CALS.

Statewide program priorities have been identified for the next three to five years. Cooperative Extension sponsored a program retreat for family, consumer and health sciences. New and innovative programs are targeting new audiences, such as outreach to "exurban clientele.” Initiatives on community vitality, climate change, rangeland health, youth development and healthy lifestyles were identified; support in program development and evaluation are provided. In order to assess whether our programs are meeting stakeholder needs, a survey of "program priorities" was developed from input from all Extension faculty. We are in the process of collecting stakeholders/clients input statewide. Extension faculty are committed to an on-going process of self-evaluation and improvement.

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. Other efforts are also employed. During the past year a multistate effort including Arizona, Colorado and Wyoming conducted a stakeholder survey of farmers with sales of $50,000 or less to ascertain the viability and sustainability of such rural family. Another

effort was conducted by the USDA's Western Region Sustainable Agriculture Research and Education Professional Development Program (WSARE PDP), who in cooperation with a research team in the University of Arizona cooperative Extension Service, conducted a region-wide survey of agricultural Extension educators to gain insight into their experiences and thoughts on the topic of sustainable agriculture. Across the western region, 626 eligible participants were identified. Four hundred seventy-two (472) completed surveys were returned, resulting in an overall regional response rate of 75%. In Arizona, 26 eligible respondents were identified and 20 returned a completed survey (response rate of 77%).

In Arizona, at least half the participants reported adequate or excellent knowledge in the majority of sustainable agriculture practice topics assessed (e.g., soil building crop rotations, ecologically-based weed management strategies, management of intensive grazing systems). The most commonly used sources of information on sustainable agriculture were other Extension educators, university researchers, USDA SARE/SAN, and farmers or ranchers using sustainable agriculture practices and systems. Information is accessed through professional publications, the world wide web, workshops, or farm and ranch tours. Sixty percent indicated that some or a great deal of their sustainable agriculture learning comes through USDA SARE-funded projects or events.

Finally, the College of Agriculture and Life Sciences this year completed an update of its 5-year strategic plan and part of that process included a public forum that included a broad cross-section of our stakeholders who provided suggestions for additions and deletions of a draft plan that was presented for discussion. The final document has been published and will provide programmatic guidance for the next five years.

PROGRAM REVIEW PROCESS

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

RESOURCE ALLOCATION

Allocation of resources across the five goals was based on available dollars, State and College priorities and available faculty with interests and expertise in the various areas.

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 revised 7-Year Plan of Work. Much of this can be attributed to our multi-state and integrated programs. We are currently involved in 60 separate multi-state projects and coordinating committees which, coincidentally, allowed us to have direct interaction with scientists from more than 44 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. The Western Region has fully implemented an integrated multi-state research and extension review, accountability and reporting process through the Regional Coordination and Implementation Committee (RCIC). Arizona is fully committed to this process and is 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. For example, the Navajo Extension Partnership (NEP) brings together Extension from six counties, the three 1862 state universities, Diné, a 1994 College, Navajo Nation Division of Agriculture and Natural Resources and others including the Tohono O'odham Community College the nation's newest 1994 Institution to address new or emerging issues in the State of Arizona. In 2005, all county directors and Extension administrators met with Diné officials to discuss their 1994 Land Grant Status, relations to 1862 Institutions and ongoing programmatic work through the Navajo Extension Partnership.

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Actual Expenditures of Federal Funding for Multistate Extension and Integrated Activities
(Attach Brief Summaries)
Fiscal Year: 2005

Select One: **Interim** **X Final**
Institution: THE UNIVERSITY OF ARIZONA
State: ARIZONA

	Integrated Activities (Hatch)	Multistate Extension Activities (Smith-Lever)	Integrated Activities (Smith-Lever)
Established Target %	3.42% %	8.62% %	7.94% %
This FY Allocation (from 1088)	1,838,970	2,033,277	2,033,277
This FY Target Amount	$62,893	$175,268	$161,442
Title of Planned Program Activity			
As described in 5-yr Plan of Work:			
1. Agricultural production system competitive in global economy	34,120	90,198	126,233
2. Safe, secure food and fiber system.	0	12,721	9,606
3. Healthy, well-nourished population.	3,763	14,075	0
4. Greater harmony between agriculture and environment.	5,199	11,392	18,062
5. Enhanced economic opportunity and quality of life.	19,811	46,882	7,541
Total	62,893	175,268	161,442
Carryover			

Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays represented here accurately reflect allowable expenditures of Federal funds only in satisfying AREERA requirements.

Director

Date

ATTACHMENT D