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***

Summary: Historically, Arizona has been an early adopter of new technologies, including laser leveling, drip irrigation, transgenic cotton, and insect growth regulators. We are continuing our tradition in technological innovation with a NASA grant to use satellite imagery to manage natural resources. Native Americans own about one-third of the land in Arizona, and according to the Agriculture Census, 78 percent of the agricultural land. The Hopi program provided below shows a specific impact for Native American clientele. Examples of work with the other 21 tribes and Nations is reported in a recent issues of the UA College magazine “Land and People”. Under the theme of Animal Health, the development of a PCR assay for major toxin genes demonstrates discovery, integration, and application of scholarship of UA veterinary scientists. Our work with Plant Health is noted in the development of educational outreach materials in plant pathology, the documented changes in behavior of Master Gardener volunteers, and identification of virus diseases across international borders. Discovery and application of biotechnology is illustrated in projects such as corn genomics and pharmaceuticals produced in plants. These Research and Extension programs reflect sample outputs, impacts and clientele benefits relative to Goal 1.

Key Theme - **Animal Health**

a. Veterinary scientists at the UA have developed what is called a multiplex polymerase chain reaction (PCR) assay that allows simultaneous detection of all the major toxin genes in one test. This represents a major breakthrough, since individual tests were previously needed for each toxin. The test has been used to diagnose thousands of C. perfringens-related illnesses at the request of community and scientific professionals. They have typed more than 3,000 isolates on request, from all across North America, and have published instructions for veterinarians who wish to run the test themselves.

b. Impact - The PCR assay allows rapid diagnosis, which enables veterinary practitioners to

quickly and logically institute control programs in affected herds. The method is cheaper than running individual tests for the four major toxins, and more accurate. Furthermore, this assay is done without the use of laboratory animals, unlike the assay which it replaces. It has become the standard, most accepted laboratory method for diagnosing clostridial diseases.

c. Source of Federal Funds - Hatch

d. Scope of Impact - Multi-State

Key Theme - **Animal Production Efficiency**

a. A livestock preconditioning program was developed with a group of Hopi livestock producers. UA Cooperative Extension Hopi Office and the Hopi Office of Veterinary Services provided information to the livestock producers, and also assisted in the development and implementation of the program. Twenty-nine head of steers were weighed at the local sales corral, then fed out at 3% of their body weight per day for 21 days.

b. Impact - The gain in weight per steer was higher than expected; 60 pounds was the average gain compared to 56 pounds from the feed program last year. Although financially the program did a little better than break even due to low cattle prices, the most important impact was change in attitude on the part of the Hopi livestock producers. They funded this project out of their own pockets, putting out nearly $600 for feed and veterinary services. They also worked to bring in new buyers who were looking for pre-conditioned steers. Two new buyers were present at the sale. Seven individuals, representing three families, participated in the program.

c. Source of Federal Funds - Smith-Lever 3b&c

d. Scope of Impact - State Specific

Key theme - **Agricultural Competitiveness**

a. A multi-disciplinary team of faculty and stakeholders developed a 153 page curriculum and held workshops for the first module of the Continuing Ranch Management School, Planning for Profitability. The curriculum includes a diagnostic spreadsheet program in Excel format which pinpoints problems for ranch profitability and assists in cash flow analysis, record keeping, and financial planning. Data used for the diagnostic template utilized actual financial and production data from the UA V-V Ranch (Agricultural Experiment Station). As a result of development of the diagnostic tool, financial and production data from the V-V Ranch was congealed into a user friendly format which will be placed on the V-V home page for public access.

b. Impact - The training provided in the workshops advanced student understanding of financial principles and record keeping. A post-course evaluation was administered to participants of the first module of the Planning for Profitability: Ranch Management School. Eighty-one percent of students surveyed stated that the way they keep records would change as a result of the workshop

and 88% reported that the workshop would influence their management practices.

c. Source of Federal Funds- Smith-Lever 3b&c

d. Scope of Impact - State Specific

Key Theme - **Home Lawn and Gardening**

a. With close to 3 million people in Maricopa County, a large percentage of them newcomers to the Sonoran Desert, there is a tremendous need for public education regarding appropriate selection, placement and care of plants. The Master Gardener program seeks to improve the health of plants and people while promoting environmental responsibility in the garden. It includes the efficient use of water, fertilizers and pesticides and the reduction of green waste.

b. Impact - Master Gardeners immediately give back to the community by teaching others what they've learned themselves. Surveys showed that participants changed their gardening behaviors to reflect environmental concerns, and influenced others to do the same. Maricopa County now has hundreds of Master Gardeners who perform this valuable service in the community. Based on pre/post evaluation, students who completed the Master Gardener program reported that they were more likely to apply water properly, select the best plants for transplanting, use soil amendments properly, prune appropriately and identify some common insects and arthropods correctly. They were less likely to attempt to control harmless or beneficial insects and more likely to tolerate some plant damage before attempting control (IPM). Participants said they improved their general gardening knowledge about soils, turf, pruning, vegetables, citrus and fruit trees, ornamentals and botany.

c. Source of Federal Funds - Smith Lever

d. Scope of Impact - State Specific

Key theme -**Plant Health**

a. Extension faculty and clientele often deal with plant diseases on a peripheral basis, needing to make reference to a particular disease or to illustrate to local audiences only the types of plant diseases that occur in their area. This project provided easy access to both a master set of slides, annotated with brief descriptions and control measures, and to a web site of plant diseases that are common in each area of the state. The web site for Extension Plant Pathology (http://ag.arizona.edu/PLP/plpext) offers information on the symptoms, biology and control of diseases that have occurred on agronomic and landscape plants in Arizona.

b. Impact - County agents, specialists and master gardeners have improved their ability to deal with plant diseases. Slide sets and web site information have been particularly useful for faculty located off campus, providing each county office the flexibility of having disease descriptions available for talks, teaching local classes, and identification and recommendations. The web site

continues to expand.

c.Source of Funds- Smith-Lever 3b&c

d. Scope of Impact - Regional

Key Theme - **Plant Health**

a. An effort was undertaken to catalog the identity, distribution, and diversity of whitefly-transmitted geminiviruses (begomoviruses), worldwide, with a particular focus in the sunbelt states of the US and adjacent states of Mexico. Polymerase chain reaction and virus-specific and degenerate primers were employed to amplify key begomovirus sequences from crop and weed hosts. Comparison of viral sequences of field isolates with well-studied begomoviral DNA sequences was used to estimate nucleotide sequence identity which serves as a basis for virus identification. The goal is to detect emergent or recently introduced begomoviruses early, prior to their spread into new crops or areas.

b. Impact - Using this approach, several new begomoviruses have been identified and additional data on begomovirus distribution were obtained for begomovirus species already described. Cucurbit leaf curl virus was identified as a new begomovirus of cucurbits in the Arizona, Texas, and N. Mexico. Merremia mosaic virus (MeMV) was also identified for the first time in bean in Puerto Rico (PR), and it may have been mistakenly identified for some time as bean golden mosaic virus (BGMV), the virus traditionally targeted by regional bean disease resistance programs. Early recognition of new diseases permits development of control measures to prevent catastrophic crop failures.

Source of Federal Funds- Hatch

Scope of Impact - Regional and International

Key Theme - **Biobased Products**

a. The ultimate goal of this collaborative research program is to locate specialty chemicals in indigenous desert plants that can be grown as industrial cash crops. Substances active against cancer are in particular demand. The U of A team selects plants, evaluates them chemically, tests products, performs biological assays, and determines how to grow and process plants commercially. Active compounds may be located in the roots, shoots, leaves, flowers or seeds of a plant. In the case of pharmaceutically active ingredients, those showing particular promise will progress into preclinical, then clinical testing for efficacy. After examining several thousand

desert plant species over the past seven years, two substances have been formally patented 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 leads, including several more that are in the pipeline for in vivo testing.

b. Impact - 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. 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.

c. Source of Federal Funds - Hatch

d. Scope of Impact - National

Key Theme - **Innovative Farming Techniques**

a. Research at the Yuma Mesa Agricultural Center has focused on 1) quantification of the amount of water saved using low-volume irrigation, 2) the identification of physiological differences in lemon trees subject to low volume and flood irrigation and 3) development of best management practices for lemon under low volume irrigation.

b. Impact - Lemon trees are being grown using low volume irrigation while providing only 17% of the water normally required for flood irrigation, with improved yield and no loss of fruit quality. Using current water prices, low volume irrigation would save growers about 9% of their yearly growing costs. The researchers have also grown lemon trees using low volume irrigation while providing about 50% of the recommended nitrogen. Based on this research, one large grower is now establishing all of his new groves with low volume microsprinkler irrigation.

c. Source of Federal Funds- Hatch

d. Scope of Impact- Regional

Key Theme - **Plant Genomics**

a. 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.

b. Impact - UA molecular geneticists have characterized about 10,000 corn genes thus far. As

they determine the function of each targeted gene, this information is entered into a computer database and becomes accessible to plant breeders, plant genetic engineers and researchers in basic biology around the world who want to know more about how plants work. They can look up gene functions and select only the genes they need to perform certain operations in plants. 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. Thousands of people are requesting these genes. 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.

c. Source of Federal Funds - Hatch, NSF

d. Scope of Impact - International

Key Theme - **Plant Genomics**

a. The SOS3 gene in Arabidopsis plants has been successfully cloned. This gene encodes a calcium-binding protein with significant similarity to yeast calcineurin B subunit and neuronal calcium sensors from animals. The results suggest that intracellular calcium signaling through a calcineurin-like pathway mediates the beneficial effect of calcium on plant salt tolerance.

b. Impact - SOS3 is a major genetic locus controlling plant tolerance to salinity stress. The cloning of SOS3 represents significant progress towards a thorough understanding of plant salt tolerance which is necessary to derive rational approaches to improve plant salt tolerance.

c. Source of Federal Funds - Hatch

d. Scope of Impact - International

Key Theme - **Plant Production Efficiency**

a. The UA Cooperative Extension Maricopa County commercial vegetable crops program has an on-going project to evaluate new techniques and herbicides for weed control in vegetable crops. Initiated in 1994, the project continually evaluates the efficacy and crop safety of newly introduced herbicides for potential use in lettuce, cole crops, melons, onions, and other crops that may be grown in rotation with vegetables in the desert. Results from the Cooperative Extension program's field experiments identified effective and safe herbicides for use in spinach and garbanzo beans that are grown in Arizona. Spinach growers through the efforts of Western Growers Association successfully secured an emergency exemption for the use of metolachlor (Dual and Dual Magnum herbicides) in 1998 and 1999. At the end of 1999, garbanzo bean growers successfully petitioned the manufacturer to request and obtain a special local need registration for oxyfluorfen (Goal herbicide).

b. Impact - Spinach growers now have a more economical tool to assure crop stand establishment with fewer weeds. The exemption for the use of Dual herbicide does not offer complete weed control but hand-hoeing costs were reduced from $1,500 to $500 for one grower. Goal herbicide compliments other herbicides that are used and provides expanded control of a wider range of weed species that typically infest garbanzo beans. Data from the UA Cooperative Extension Maricopa County commercial vegetable crops program supported the growers in obtaining the use of the new tools for weed management.

c. Source of Federal Funds - Smith-Lever

d. Scope of Impact- Statewide

Key Theme - **Biotechnology**

a. The overall objectives of this project are to develop improved techniques for the cultivation of hybridoma cells with the goal of increasing monoclonal antibody production. Specifically, noninvasive monitoring techniques using NIR spectroscopy were used to measure the concentrations of nutrients and metabolites and to use this information along with metabolic models to develop and apply control mechanisms to maintain the cells in an optimal environment for antibody production. We have developed techniques and calibrations to quantify 19 components simultaneously. These include glucose, glutamine, ammonia, lactate, and glutamate in a variety of aqueous materials similar to the cell culture media.

b. Impact - This work provides for a means to measure the concentration of multiple components which is required for development of optimal control schemes thus improving the efficiency and cost of operating bioreactors for production of biochemicals and for degradation of undesirable components.

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

Summary: Food safety has become visible nationally and locally due to outbreaks of *E. coli* 0157:H7, *Campylobacter jejuni*, and Bovine Spongiform Encephalitis (BSE)in Europe. Outbreaks in the future will likely be widely dispersed, intermittent, and geographically diffuse. Research and Extension programs are addressing contamination from pre-harvest to post-harvest to retail. We have a new joint program with the College of Public Health which is expanding programs in healthy lifestyles, nutrition, and food safety. With funding from the Center for Disease Control, educational programs will target Hispanic and Native American communities. Our successful EFNEP program addresses food-borne illness in the home and has continued impact on clientele in select areas of Arizona as described below.

Key Theme - **Food Safety**

a. Safe Food 2000 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 Food borne 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, Train the Trainer for 70 volunteers and local classes, and an annual 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 newspaper, and Safe Food Weeks, when food safety information packets are delivered to print and broadcast media for dissemination to the public.

b. 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.

c. Source of Federal Funds - Smith-Lever 3(d)--EFNEP

d. Scope of Impact- Local

Key Theme - **Foodborne Pathogen Protection**

a. Oysters on the half shell lose their glamour if they've got *Campylobacter* or *Salmonella* lurking in their tissues. Clams and oysters collected from bays and estuaries in both North Carolina and Oregon were tested for these pathogens. Salmonella was detected in 50 to 70 percent of clams and oysters tested. The incidence of Campylobacter was 10 to 15 percent.

b. Impact-This incidence of pathogens, particularly in oysters because they are most often eaten raw, is cause for concern. The depuration process used to reduce the concentration of *E. Coli* in oysters does not reduce *Campylobacter* or *Salmonella*. Reduction of contamination if the bays and estuaries may be the only answer to the safety of these products.

c. Source of Federal Funds--Hatch

d. Scope of Impact--National

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

Summary: Several programs address human health and nutrition. The study on the differences in egg cholesterol versus other food cholesterol may have an impact on the diets and plasma levels of cholesterol. In Arizona, as in other states, the population ranges from poverty to excess; obesity has increased significantly. Our program on physical activity promotes physical activity to reduce obesity and several other health risks. Additionally, our educational program to prevent osteoporosis helps women increase knowledge and motivate behavior change.

Key Theme - **Human Nutrition**

a. A meta-analysis was conducted at the UA using 224 cholesterol studies completed during the past 25 years. The research concluded that eating cholesterol has a minimal effect on blood cholesterol. Saturated animal fat has a greater impact on plasma cholesterol than dietary cholesterol, according to Wanda Howell, the lead researcher for the study. "For most people, dietary cholesterol does not raise blood cholesterol levels." The researchers are continuing to maintain the database on the effects of dietary cholesterol and are currently looking at potential differences in egg cholesterol versus other food cholesterol. Preliminary analyses indicate that egg cholesterol may have even less effect than other sources. The study has been included in the Database of Abstracts of Reviewers of Effectiveness (DARE), a publicly available database in the United Kingdom, located at the NHS Center for Reviews and Dissemination at the University of York.
b. Impact - According to Howell, "Healthy individuals with normal blood cholesterol levels should now feel free to enjoy foods like eggs in their diet every day." As a protein source, eggs are cheaper than most meat products, which would reduce food bills for people who begin to buy eggs more often in place of meat. A rise in egg consumption in the United States would directly affect the egg industry through increased sales and an increased demand for production.

c. Source of Federal Funds- Hatch

d. Scope of Impact - National

Key theme - **Human Health**

a. In partnership with the College of Public Health, this project helps pre-menopausal women identify their risk and modify their diet and physical activity levels to prevent or slow the development of osteoporosis. The project includes peer education, a social marketing campaign, the use of diagnostic tests (such as bone mineral density tests) and questionnaires regarding lifestyle habits and family histories to help women identify their risk and motivate behavior change.

b. Impact - Increased awareness of the risks and ways to prevent osteoporosis were achieved through workshops, brochures, posters, presentations, training sessions, and marketing activities. Prevention behaviors, such as screening, diet and exercise, were evaluated using a risk assessment and presentation survey. Although 24.5% of the participants did not answer the questions about whether they were already planning to make changes to reduce risk for osteoporosis, 48% of those that did, reported they were already intending to make changes more than six months prior to the session. Of the participants who reported not having intentions to change prior to the session, 43% said they intended to make changes within one month and 14% would make changes within six months. The most commonly reported intended change was to increase exercise. Most participants (66%) felt they had at least a moderate amount of osteoporosis prevention knowledge prior to the session. Eighty-six percent felt that this knowledge increased because of the presentation. Eighty-nine percent of the participants rated the session as moderately excellent to excellent.

c. Source of federal funds - Smith Lever 3(b) & (c)

d. Scope of impact - State

Key theme - **Human Health**

a. This partnership between Cooperative Extension in the College of Agriculture and Life Sciences and the College of Public Health promotes physical activity as a way of reducing risk of obesity, heart disease, certain types of cancers, arthritis and osteoporosis. Inputs include a media and work site campaign, presentations to civic and work site groups, and involvement in established community events to promote physical activity.

b. Impact - Baseline data and survey data analysis revealed that there was a significant change in perceptions of self-efficacy in the target group (adults 30 to 64 years old). The campaign was designed to reduce barriers, emphasize benefits and prompt people to think about being physically active. There also was a statistically significant reduction in the level of no leisure-time physical activity for adults age 40 to 64 years old. Survey information on the work site program shows that this is an effective method to assist participants in increasing their level of physical activity.

c. Source of federal funds: Smith Lever 3(b) & (c)

d. Scope of impact - local

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

Summary: Increased productivity in food and fiber crops can be attributed to both genetics (50

%) and natural resource management (50 %). In Arizona, we are addressing both. Research and Extension programs are exploring the benefits of instituting environmentally sound natural resource management programs. The social and economic benefits from these practices are being quantified and compared to the costs of not implementing these programs. Likewise farmers are using the results of biotechnology, such as transgenic cotton, for managing pests. Use of new resistance management tools along with IPM efforts reduces insecticide use, conserves biological control agents and enhances sustainability and profitability. The following list of accomplishments and impact assessments in the areas of air, water, soil, IPM and biotechnology provide some examples of new tools, environmental implications, and public good.

Key Theme - **Air Quality**

a. Dust produced through tillage operations can result in lost topsoil, reduced visibility, hazards for equipment operators and reduced air quality. Particulate emissions from five different tillage systems were determined and the data used to evaluate the appropriateness of an equation used by the EPA to estimate emissions. Of the five systems evaluated, a stalk puller and a USM (uprooter/shredder/mulcher) implement produced the fewest emissions. It was also determined that the EPA's AP-42 emissions factor equation was inaccurate to begin with because it only had one variable in it: silt content.

b. Impact - The goal of this work was to provide improved data to document more accurately the dust contribution from agricultural tillage operations. To this end, measured emissions figures were half those predicted by the equation. During the 1998 session, the Arizona Legislature passed a law creating a task force to set up best management practices (BMPs) for field operations to help reduce dust in the air. This research has contributed to the development of reasonable practices growers can implement to meet the BMPs.

c. Source of Federal Funds- Hatch

d. Scope of Impact - Regional

Key Theme - **Water Quality**

a. Contaminated ground water causes significant disease outbreaks in the U. S. every year. Most of these outbreaks are believed to be caused by enteric viruses. A less costly, polymerase chain reaction (PCR) method was developed for detection of enteroviruses in groundwater and it was compared with the traditional cell culture assay method. Enteroviruses were detected three times more often in groundwater used for drinking purposed by PCR that by the traditional method.

b. Impact - These results suggest that groundwater contamination by enteroviruses is more common that previously thought. A relatively cheap, highly sensitive method is now available to detect such contamination which will allow preventative measures to be implemented and thus reduce the incidence of disease.

c. Source of Federal Funds - Hatch

d. Scope of Impact - Global

Key Theme - **Integrated Pest Management**

a. 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. 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. The education component of this program has assisted growers in implementing this strategy during the last three cotton seasons.

b. Impact - In response to this IPM program, more than 50% 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. Arizona extension cotton specialists have been able to teach and demonstrate to growers that these 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. 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. The success of this program has led for the first time efforts to control Lygus across multiple crops (Lygus are highly mobile and feed on several crops in addition to cotton). Growers have begun meeting with Cooperative Extension personnel to develop cooperative plans involving cropping sequences and cultural controls to reduce damage from Lygus.

c. Source of Federal Funds - Hatch, IPM 3-D Smith-Lever

d. Scope of Impact - Regional

Key Theme - **Integrated Pest Management**

a. An integrated pest management program implemented two new tools in 1997 and continued their use in 1998: insect growth regulators (IGRs, effective against whiteflies) and transgenic cotton. The UA College of Agriculture and Life Sciences collaborated with growers, the USDA, the Arizona Department of Agriculture, the Arizona Cotton Growers' Association, Cotton Incorporated, 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.

b. Impact - As a result of this program, during 1999 the average foliar insecticide use in Arizona cotton was the lowest in 20 years, according to state records first kept in 1979. Overall, 1999 had the lowest number of foliar sprays against all insect/arthropod pests in cotton during the 90s, and the lowest costs per acre during the same period. In 1990, growers applied about 11 sprays during the season at an average cost of $113.76. By 1999 this number had dropped to 1.74 (between one and two sprays) at an average cost of $34.50. For silverleaf whitefly (SWF) in particular, the number of sprays dropped from 1.80 per season in 1992 to 0.40 for the season in 1999. Lint quality went from "very sticky" in 1992 to "very clean" in 1999. In 1992 SWF sprays cost an all time high of $91.80 per acre, and amounted to nearly 75% of the total foliar insect control budget. By 1999 growers spent an average of $10.83 per acre on SWF, which was only about 30% of the total foliar insect control budget. This was the lowest amount of money per acre spent to control SWF since its introduction to the state in the early 1990s. This success was mainly due to the efforts of the Arizona IPM program and the availability of IGRs and transgenic cotton in reducing the number of insects that appeared. Weather patterns and other factors may also have influenced the appearance of fewer numbers of insects in 1999. 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.

c. Source of Federal Funds - Hatch Act, Smith-Lever 3(b) and (c), Special Research Grants, Smith-Lever 3(d)

d. Scope of Impact - Regional

Key Theme - **Soil Quality**

a. Soil scientists at the UA, have tested four different strategies for monitoring water and chemicals as they pass through the vadose, or unsaturated zone in soil. The field site is a one-acre plot of bare ground criss-crossed with a very dense surface drip system set up in a grid for applying water and selected tracking chemicals. Various measuring tools were installed in different configurations throughout the field. These have been evaluated for effectiveness and practicality.

b. Impact - Governmental agencies are incorporating these monitoring methods into their repertoire of strategies for reducing contaminants in the environment. Representatives from the EPA, Department of Energy, the NRC and the Agricultural Research Service attended technology transfer meetings held on-site in Arizona and in Washington D.C. to learn more about these strategies for monitoring contaminants in soil. In addition, tests on computer models using the data from this project are currently underway. These models will soon be used at sites in the U.S. where groundwater contamination is suspected.

c. Source of Federal Funds - Hatch

d. Scope of Impact - National

Key Theme - **Water Quality**

a. A soil aquifer treatment was tested using a 37-meter layer of soil as a filter. Wastewater was purified as it passed through, and was then collected in underground storage tanks. This is a natural, sustainable system that will not wear out. It takes the place of building a conventional treatment plant.

b. Impact - The soil aquifer treatment significantly reduced enteroviruses as they passed through the soil. Groundwater samples held no Giardia. Two organic compounds present were reduced by 92% and 85% respectively, and total nitrogen leached out 47% during recharge. The project has now expanded to include the City of Phoenix in Arizona, and Los Angeles and Orange Counties in California, at the request of those communities.

c. Source of Federal Funds - Hatch, EPA

d. Scope of Impact - National

Key Theme - **Wildlife Management**

a. One of the biggest controversies in management of wildlife in the desert southwest is whether it is necessary to provide supplemental water. This becomes very complex as it involves wilderness areas which ban intrusions and several endangered species. The diets of Sonoran pronghorn (Antilocapra americana sonoriensis) were examined to determine if total water requirements could be met through foraging. It was determined that water from forage alone is not adequate to support the population.

b- Impact - Natural existing resources are not adequate to support maintenance of the population. Intervention will thus be necessary to maintain this endangered species.

c. Source of Federal Funds- Hatch

d. Scope of Impact - Regional

Key theme- **Land Use**

a. The majority of Arizona residents are not native to the state; they bring a diversity of views, environmental ethics and awareness levels to the area. This project sought to increase awareness and technical knowledge in the community regarding human impacts on the natural resources of the area, leading to positive change in behavior. The project developed a peer reviewed curriculum to stimulate learning through exploration and discovery, trained volunteers using this

curriculum, and utilized a “train the trainer” volunteer model to deliver the education.

b. Impact - Professional development opportunities were provided to assist teachers in meeting the new state mandated certification renewal requirements. Qualitative and quantitative evaluations showed changes in attitude and knowledge of participants. Further implementation of the project should increase the knowledge, understanding, attitudes, skills and abilities of youth and adults regarding natural resource conservation. A further benefit of the project is the development of partnerships with community groups, such the environmental education centers (Natural Resources Conservation Districts). The program coordinators through these centers will assist participants in further developing and implementing programs for youth.

c. Source of Funds- Smith-Lever 3b&c

d. Scope of Impact - Regional

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

Summary: In this era of federal deregulation and block grants to states, Arizonans have both the opportunity and the challenge to deal with parent and youth issues such as teenage pregnancy, literacy, fiscal management, workforce preparation, poverty, parenting, and youth development. There is clear evidence that community efforts can help prevent teenagers from having babies, committing crimes, and dropping out of school. With this in mind, Research and Extension programs, in partnership with many state agencies and private sector organizations, have implemented a variety of programs to deal with some of these social challenges. The accomplishments listed below and the resulting impacts on the lives of adults and youth attest the efficacy of community and partnership efforts. Universities must work with local communities to really address people needs. Partnership and teamwork are the keys to success.

Key Theme - **Children, Youth, and Families at Risk**

a. Five youth, one adult volunteer, and an extension educator participated in the "Teen Biz" program, offered through the UA in 1995 and developed the idea for a youth center. After gathering monetary support from the Parker Area Alliance for Community Empowerment and other county, city and university sources, they opened the Players 9th Street Youth Center. It was expanded in 1997 and now features a snack bar, large open game/activity room, computer room, learning kitchen, meeting room, and offices in a 4,000 square-foot facility centrally located in town. The center is available for youth groups and youth serving agencies to use as a meeting location. In 1999 more than 16 organizations met at the center.

b. Impact - The Player's center, which operates on a membership basis, has become the major focus of youth activity in Parker. More than 1200 youth aged 10-18 have purchased memberships since the center opened. About 65 youth ages 13-17 have obtained employment

training via the center; another 65 have developed job skills through volunteering. As of January, 2000, youth had volunteered 4134 hours and adults 1538 hours, saving the center $43,263 in operating expenses. These Parker youth programs have succeeded to the point that they have become a model for similar programs in other communities. Five Parker youth leaders were asked to present their success story of the youth center "Moving Beyond Talk" to 125 participants at the Sedona Town Hall in Flagstaff. Youth Center teens also facilitated a workshop for 18 youth and adults from Navajo County to learn how to start a youth center. Two youth now serve on the Governor's Youth Commission and started a local group that assists with decisions about their youth center. Teens also made presentations at the National School Age Workshop in Seattle on the youth center. Results speak loudly here with the actual construction of the youth center through a community development block grant.

c. Source of Federal Funds - Smith-Lever 3(b) and (c)
d. Scope of Impact - Local

Key Theme - **Children, Youth, and Families at Risk**

a. More than 5,000 students in grades five through nine, from the rural communities of Chinle, Eloy, Globe, Miami, Casa Grande, Hayden-Winkelman, San Carlos, Mohave Valley, and Yuma, Arizona have completed five 40-60 minute sessions on postponing sexual involvement. The sessions are designed to assist pre-teens and young teens in recognizing existing pressures to engage in premature sexual behaviors, to increase their awareness of the benefits of postponing sexual behavior, to provide skills that will enable them to postpone sexual behavior, and to encourage them to examine their personal values about sex and recognize the risks associated with premature sexual activity.

b. Impact - More than 5,000 pre-and post-test surveys completed over a four-year period indicate that the program affected subgroups of teens differently. Students who benefit from the program by changing their sexual behavior also tend to have protective factors in their lives such as good relationships with parents, good grades, and future educational aspirations. Those who don't tend to report higher rates of delinquent behaviors. Overall, the program also seemed to have a greater impact on females than on males. Adults and teens in the four communities said they liked the program and wanted it to continue.

c. Source of Federal Funds - Smith-Lever 3(b) and (c)

d. Scope of Impact - Regional

Key Theme - **Consumer Management**

a. Since 1991 the UA 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. A new national partnership is being formed with the Credit Union National Association (CUNA) that will provide additional support for

expansion of the program through training models for credit union professionals interested in working with high schools in their local communities.

b. Impact - Approximately 38,235 Arizona high school students and other youth 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% of the students demonstrated an increase in financial knowledge or behavior when dealing with money.
c. Source of Federal Funds - Smith-Lever 3(b) and (c)

d. Scope of Impact - Statewide

Key Theme - **Family Resource Management**

a. A task force was formed comprising local, county and state partners from Extension, public schools, volunteer organizations, government, Native Americans, and non-profit agencies. Program guidelines, curricula and marketing strategies were gleaned from national MONEY 2000+ participating states, CSREES, and the USDA. The MONEY 2000+ program is a Financial Management Education Program designed to increase the financial well-being of participants in the program through increased savings and reduced household debt. Arizona individuals and families were encouraged to set financial goals to be achieved by the end of the year 2000 or a date of their choice. For a $10 enrollment fee, Extension provided each participant with financial education: start-up kit, record-keeping materials, seminars, workshops, classes, home study course, educational materials, a quarterly newsletter, video loan, ongoing support with six-month follow-up and help from mentors.

b. Impact - As of December 31, 1999, the total dollar impact of MONEY 2000+ in Arizona, with 3 counties reporting impact data, was $356,396 of financial improvement that included $145,974 of increased savings and $210,422 of reduced debt. There are 294 households enrolled in Money 2000 in Arizona. County and state statistics were compiled and reported to Cornell Cooperative Extension for a national impact. As of December, 1999, the total dollar impact of MONEY 2000+ nationwide, with 32 states reporting impact data, was just over $12 million. That includes $6,767,581 of increased savings and $5,262,074 of reduced debt. Currently the program has over 12,000 households enrolled nationwide These figures represent a 119 percent financial improvement since last year, and a 71 percent increase in households enrolled in MONEY 2000+.

c. Source of Federal Funds - Smith-Lever 3(b) and (2)

d. Scope of Impact - Statewide

Key Theme - **Literacy**

a. Project SOAR is an extensive mentoring program for elementary school youth who are in

danger of academic failure and of engaging in high risk behavior. The program is jointly administered by the Arizona Supreme Court, Arizona Cooperative Extension Family Community Leadership/4-H Youth Development, two elementary schools and two community colleges. Students, parents and mentors work together in a comprehensive program that includes mentor training, academic support, skill building, leadership enhancing opportunities, parental involvement, and social and personal interaction. Held at Hamilton and Fry elementary schools in the Phoenix area, it targets ethnically diverse students and families, with primary focus on Hispanic, African American and Native American students.

b. Impact - Officer referrals decreased by 77% at one school site. Average attendance increased by 5 days at Fry school. Students reported 2.4 on a 3 point scale in knowledge gained in SOAR. Pre/post student behavior scales by teachers showed a significant increase in scores of 3.72 points (using tests). Using a 4-point scale, parents reported that their children exhibited positive behavior changes (3.6), good school work (3.8), positive attitude (3.6), less violence (3.9), less delinquency (3.3) and less gang participation (3.9). About 76 % of the students increased their academic performance.

c. Source of Federal Funds - Smith-Lever 3(b) and (c)

d. Scope of Impact - Statewide

Key Theme - **Parenting**

a. More than 40 paraprofessionals from the Department of Economic Security, Head Start and other agencies are joining with extension volunteers to work one-on-one with at-risk families. The Extension-developed curriculum includes child development, parenting skills, home management techniques, life skills and resource referral. Partnering of families and volunteers works because they can relate to each other. Volunteers range between 16 and 75 years of age, and are of all ethnic backgrounds. They come from the same communities as the family with whom they work.

b. Impact - During 1999, 1,572 families participated in the Pinal Parent Project. Eighty-nine percent of the participants reported that the discipline they use at home with their children is less harsh and has improved. Ninety-four percent reported that their lives have changed in a positive way as a result of the classes. The program has expanded over the past year to include audiences not previously reached, including court-referred truancy cases, about-to-be-released prisoners, who will be returning to parenting roles, and welfare-to-work (TANF) participants.

c. Source of Federal Funds - Smith-Lever 3(b) and (c)

d. Scope of Impact - Statewide

Key Theme - **Workforce Preparation - Youth and Adult**

a. The Extension Connection provided a six-week life-skills program with components designed to help families become more conscious of healthy and nutritious meals; aware of food safety; self-sufficient; equipped to handle their families need and concerns; better at understanding that work is a means to achieving goals not the end all; more able to take better charge of their lives; more valuable to their community; acclimated to employment and education and better able to budget and plan their money. Participants in the program ranged from former gang members to newly arrived immigrants to the United States whose lack of English and American job skills caused significant barriers to employment. Ninety-five percent of the program graduates were members of racial or ethnic minorities, 40% had less than a high school education; many had criminal records.

b. Impact - Of the 50 people who completed the program in 1999, twenty-eight were female heads of households. Job placement was a part of the program; 45 of the participants secured jobs. Positions paid from $5.50 to $12.60 per hour. Participants reported that the program helped them regain their self-esteem, get on track to a job and career and open the doorways to continue their education. Hadco, the first company to work with Project S.T.R.I.D.E, has gained 12 employees in its manufacturing facility, with four working more than a year thus far.

c. Source of Federal Funds - Smith-Lever 3(b) and (c)

d. Scope of Impact - Local

Key Theme - **Workforce Preparation - Youth and Adult**

a. The PHASE program (The Project for Homemakers in Arizona Seeking Employment), begun in 1978 in Tucson, Arizona, assists women with job related scholarships and in job placement, including job-seeking skills. The Arizona State Department of Education has funded PHASE along with contributions from businesses and individuals. It is a joint effort between Pima Community College, which often trains the students for immediate employment, legislators who support the program, corporate and individual donors, and the School of Family and Consumer Resources in the College of Agriculture and Life Sciences at the UA.

b. Impact - PHASE has assisted more than 6,000 single parents, displaced homemakers and incarcerated women in Pima County since 1978. About 15% of its clients continue their studies at the UA, and to date, these students have a 100% graduation success rate. It has become a national model for similar programs throughout the U.S. In 1999 the program assisted incarcerated women in particular, with job skills, nontraditional employment, and basic computer skills.

c. Source of Federal Funds - Smith-Lever 3(b) and (c)

d. Scope of Impact - Local

Key Theme - **Youth Development/4-H**

a. " Trick or Treat So Others Can Eat" was an Arizona 4-H Community Service project held in 1999 to benefit community food banks. Youth were encouraged to trick or treat for non-perishable food items. About 614 youth collected food in seven counties across the state. The UA's Collegiate Wildcat 4-H Club was a part of this activity; they donated part of their collection to Tucson's Ronald McDonald House.

b. Impact - In 1999, more than 12,447 pounds of food were collected from across Arizona, nearly double the amount collected in 1998. Not only was a large amount of food made available for needy families, the program also promoted the 4-H program's commitment to youth and adult partnerships and its emphasis on youth making a difference in the community.

c. Source of Federal Funds - Smith-Lever 3(b) and (c)

d. Scope of Impact - Statewide

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, 2001, 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 -- V-V Ranch (Agricultural Center), Family and Consumer Sciences, Horticulture, Natural Resources as well as several county reviews for 4-H Youth Development. 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.

Two statewide planning sessions have been held. First 50 community and business leaders and 30 University faculty, staff, and 4-H youth met to review and evaluate statewide programs by the College. Second, the College of Agriculture and Life Sciences developed a five year strategic plan based on faculty, staff, student and stakeholder input. Six program areas were identified as the College-wide framework to guide all administrative units in developing and directing their programs: ANIMAL SYSTEMS; ENVIRONMENT AND NATURAL RESOURCES; FAMILY, YOUTH (4-H), AND COMMUNITY; HUMAN NUTRITION, FOOD SAFETY; AND HEALTH; MARKETING, TRADE AND ECONOMICS; PLANT SYSTEMS.

These six programs are the basis for budget allocations and program reviews.

As part of our ongoing review process and as a first step toward renewal of the Strategic Plan, we mailed a survey in April of 1999 to stakeholders including board members, former students and community leaders. The survey focused on the six program areas within the College. We asked six questions: How are we doing in these programs? How frequently do you use these programs? Are programs provided in a professional manner, in a timely basis, with quality information and education? What are programs that are particularly important to you? What kind of problems are you concerned about? How satisfied are you with the College of Agriculture and Life Sciences and the University of Arizona?

The survey was sent to 45 students who graduated from the College in 1994; 47 students who graduated in 1997; 105 County Extension Advisory Board members (appointed by County Supervisors to represent county interests); 46 principals of high schools, the Council of the Southwest Indian Agricultural Association; the Council for the School of Renewable Natural Resources; the Advisory Board of the Yuma and Maricopa Agricultural Centers; student leaders of FFA, College student ambassadors, and the 4-H Teen Council. Approximately 388 surveys were sent and 179 were returned, for a response rate of 46 percent. The demographics of the respondents were provided in the previously submitted Plan of Work. In the last year, we have followed up on the survey with additional respondents and conducted two public forums, one in Central Arizona (Phoenix) and one in Yuma. Notice of the open forum appeared in local newspapers and through direct mailings.

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

A review of activities and actions during the past year reveals that we have made progress on nearly all of the goals and outcomes outlined in the 5-Year Plan of Work. There are multiple reasons for this productivity, but much can be attributed to our multi-state and integrated

programs. We continue to be involved in 46 separate regional projects and coordinating committees which, coincidentally, allowed us to have direct interaction with scientists from 46 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 western region has always had reasonable input from Extension personnel in the "old" regional research program. It is obvious that the west is leading the effort to more fully incorporate extension into most of the projects and coordinating committees. 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 at the outset of this report, Arizona would have to be considered a model with respect to integration of research and extension programs. 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 do not really have very 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.

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: __X_ Multistate Extension Activities
____ Integrated Activities (Hatch Act Funds)
____ Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	FY 2000	Actual Expenditures FY 2001	FY 2002	FY 2003	FY 2004
As described in report of accomplishments and results	$153,520				
Total	$153,520				

March 1, 2001

Form CSREES-REPT (2/00)

Appendix C

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
__X_ Integrated Activities (Hatch Act Funds)
____ Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	FY 2000	Actual Expenditures FY 2001	FY 2002	FY 2003	FY 2004
As described in report of accomplishments and results	$98,090				
Total	$98,090				

March 1, 2001

Form CSREES-REPT (2/00)

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)
_X__ Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	FY 2000	Actual Expenditures FY 2001	FY 2002	FY 2003	FY 2004
As described in report of accomplishments and results	$152,100				
Total	$152,100				

Director **March 1, 2001**

Form CSREES-REPT (2/00)