

# Making a Difference 2012

## Extension Education in Cochise County



COLLEGE OF AGRICULTURE  
AND LIFE SCIENCES

COOPERATIVE EXTENSION  
Cochise County



The University of Arizona Cooperative Extension represents a unique three way partnership of the federal, state and county government to provide local citizens access to the Land Grant University System. Partners include the United States Department of Agriculture, the University of Arizona and Cochise County. Regardless of the program, Extension expertise meets public needs at the local level through the involvement of volunteers, stakeholders and advisory committees. Our roots in communities help us understand local needs and put university expertise and connections where they can make a difference - both in people's lives and in their livelihoods. Increasingly, Extension serves a growing, more diverse constituency with fewer resources, utilizing methods that are timely, relevant and cost-effective. These Extension-driven programs leverage and multiply each dollar of county and state support with additional outside funding. Included in this report are a few highlights of Extension's impact on this county and its people during 2012.

## Cooperative Extension, Cochise County

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## Rangeland Management

### Relevance

Rangeland livestock production is an important part of the agricultural base in southeastern Arizona. There is a need to balance livestock grazing with natural resources. This is especially important as livestock producers have been managing herds in drought conditions for the last 15 years.

### Response

Three educational workshops/trainings were conducted covering rangeland and livestock management topics. The workshop topics and presentations were developed as team efforts. They included: *Being a Range Cow is a Hard Way to Make a Living: Range Livestock Nutrition*, *Rangeland Monitoring Based on the Guidebook to Rangeland Monitoring and Assessment*, and *Managed Grazing of Beef Cattle on Arizona Rangelands*. A total of 126 people attended one or more of these workshops. As part of the Rangeland Monitoring & Inventory Program, 37 sites on 19 BLM allotments and 51 sites on 19 USFS allotments were monitored. Monitoring reports were prepared for each allotment and given to agencies and ranchers.



### Results

All workshop ratings are on a scale of 1 being not valuable to 5 being very valuable. Two workshops were evaluated and averaged a rating of 4.4 (49 evaluations turned in). Ninety-six percent of participants were able to list two key concepts taught at the workshop. Seventy-six percent of participants listed at least one specific new management practice that they intend to implement in the next two years. Forty-eight percent of ranchers were actively engaged in the monitoring of their allotment.

## Noxious Weeds



### Relevance

The spread of noxious weeds on public, state trust and private lands in southeastern Arizona poses risks to rangeland animals (wild and domestic), threatens biodiversity and native plant species, damages park land and natural resources, and causes economic hardship for landowners. Estimates indicate that invasive plants are spreading at about 4,600 acres per day on federal lands alone in the Western United States. Weeds have invaded approximately 17 million acres of public rangelands in the West - more than quadrupling their range from 1985-1995 (USDI-BLM, 2009). Southeastern Arizona has relatively small infestations of noxious weeds compared to other areas in the West. This gives us a unique opportunity to be proactive and control weeds so that it doesn't become economically prohibitive.

## Response

Three noxious weeds workshops were held. Working with the Coronado RC&D, landowners who attend a workshop and have infestations of targeted weeds can check out herbicide, surfactant, and equipment at designated locations to treat noxious weeds on their private land. Cochise County road crews treat priority infestations as they are able.

In 2012, 685 acres of Russian knapweed, onionweed, African rue, and Malta starthistle infestations were treated in Cochise and Greenlee counties.

## Results

One workshop was evaluated by participants and was rated at a 4.6 (1 being not valuable to 5 being very valuable). Of those who turned in evaluations, 100% were able to list two key concepts taught at the workshop. Sixty-five percent listed at least one specific new management practice that they intend to implement in the next two years.

In 2010, the Rancho Sacatal 4-H Club pulled 220 lbs. of onionweed at two residences and the US Post Office in Portal prior to the plants going to flower and seed. In 2011, 0.5 lb. was pulled, and in 2012, 3.75 lbs. were pulled from the same properties.

## **Agronomic Crops**

### Relevance

Production of field crops in the Cochise County area is very diverse including but not limited to corn (silage and grain), small grains (wheat and barley), dry beans (pinto and other assorted types), cotton, and grain sorghum. Rising production costs associated with seed, fertilizer, water, and energy are making it difficult for growers to remain profitable at current commodity price levels. Recent technological advances such as transgenics, innovative pest control chemistries, improved varieties and hybrids, and site specific management technologies, to name a few, have the potential to help growers regain competitiveness in a global production marketplace. Implementation of these new technological advances can be daunting for the grower. Our responsibility in Cooperative Extension and Agricultural Experiment Station is to develop sound recommendations through research and demonstration of how best to implement these new advances in an economically and agronomically sustainable fashion.

### Response

During the calendar year 2012 several research projects were conducted to continue to refine current recommendations and to evaluate several new technologies and their application to production systems in the Cochise County area. These projects included; corn hybrid evaluations with several hybrids containing novel genetics providing new options for control of corn earworm, evaluation of currently available cotton cultivars with a variety of transgenic traits, and evaluation of site-specific management techniques for control of plant parasitic nematodes in dry beans. An additional trial evaluating new and commercially available fungicides along with a relatively



new biological product used for control of sclerotinia (white mold) in dry beans (pinto) was conducted. Results from 2012 projects along with summaries of previous years' work was presented at several grower field days and meetings during 2012 and early 2013. These meetings included a corn field day (September 2012), winter corn production meeting (November 2012), Southeast Arizona Ag Day (February 2012 and 2013). Numerous individual farm visits to clientele across the southeast region of Arizona were also conducted during the year to help trouble shoot crop production issues and to extend information from our research programs.



## **Results**

Results from the research projects and demonstrations have proven the potential for significant economic benefit for growers adopting recommendations based upon these results. Two years of evaluation data of the new Bt technology for corn earworm control has demonstrated a minimum of 5% yield increase. Results from evaluating site-specific management of nematodes have demonstrated the ability to reduce nematicide use by slightly over 50% (depending on soil texture distribution) by applying only to the areas of the field with damaging thresholds of nematodes. Results from the 2012 dry bean fungicide evaluation yielded new information related to the infection mechanism of the pathogen which will help better manage the pest in the future. The results from the trials in 2011 and 2012 have led to the submission of a two-year proposal to the Arizona Department of Agriculture, as part of their Specialty Crop Grant Program, to evaluate control of disease and nematodes in Dry Bean. If this proposal is funded a significant research program will begin in the fall of 2013 to help support current efforts in this area.

## **Enhancing and Conserving Natural Resources and the Environment**

### **Relevance**

Arizona's increasing population has an enormous impact on vast tracts of public and private land. The complex mix of land ownership can create challenges in managing natural resources on a landscape level. Changes in environmental conditions (drought conditions for the past 15+ years, wildfires of large size) further complicate decision making regarding natural resources and create an ever changing situation for land managers, producers, and homeowners. It is important for residents to implement best management practices through proper selection and maintenance of plant materials, with an emphasis on reduced pesticide and water inputs. Sustaining Cochise County's natural resources is important to citizens from both social and economic perspectives. Informed land use decisions are the key to protecting the natural resources, community character, and long-term economic health of all Arizona's communities. Programs aimed at increasing knowledge and the application of best management practices include: Water Wise, Master Gardeners, and Backyards and Beyond magazine. The overall goal is that participants will reduce unnecessary inputs in the form of labor and time, irrigation water, money, fertilizers, and pesticides, as well as increase behaviors that will conserve and enhance our natural resources.

### **Response**

#### **Water Wise Youth**

There are many ways to emphasize the culture of water conservation. This is being accomplished in Sierra Vista, Ft. Huachuca and areas throughout the county through teacher training, classroom presentations, family science nights, after school programs and educational water festivals. Educational models such as the Groundwater Flow Aquifer, Rolling River, Water History Trunk, and the EnviroScape, appearances by Wettle the Waterdrop, and hands-on activities directly aligned to the Arizona standards, are the backbone of an evolving curriculum to teach children important concepts in water education.

## Water Wise Community Education

Water wise provides educational materials and programs to the public on water conservation, water wise landscaping, irrigation efficiency, water harvesting, storm water management, erosion control, backyard wildlife habitat and other natural resource management practices. Water Wise Audits/on site consultations are offered to homeowners, businesses, developers, and builders to identify and evaluate different options for reducing water consumption, providing for on-site use of rainwater and conserving natural resources associated with their property. Recommendations are tailored to the unique conditions of the property and the objectives of the property owner. The Water Wise info-line and Water Wise Information Centers are maintained at different locations in various communities throughout the county. Demonstration projects are developed where residents can observe different techniques for water conservation, rainwater detention and erosion control.

## Water Wise & Energy Smart

Through a contract with the Department of Defense the WWES program provides water and energy conservation education and related support to approximately 10,000 U.S. Army and civilian employees and 4,500 family members who either work or live on Fort Huachuca, Arizona. The program aims to increase the awareness of water and energy conservation to the military mission along with identifying and assisting in carrying out specific measures to accomplish the conservation. This year, the supervision of the program on Fort Huachuca was shifted from the fort hydrologist to the fort's Energy Manager to reflect an increased emphasis on energy conservation measures and the Army mandate to conduct energy audits on all buildings every four years. Consequently, the WWES program increased activities in the energy conservation aspect of the contract.

## Master Gardener Program

Master Gardeners are trained volunteers who provide educational information to Cooperative Extension clientele. Cochise County Master Gardener Volunteers support the University of Arizona Cooperative Extension by providing researched-based information on environmentally responsible gardening and landscaping to the public. They teach good gardening practices through hands-on demonstrations, educational display gardens and one-on-one consultations. To become a Master Gardener they complete the 14 week training course requirements and complete 50 hours of volunteer service. To maintain their certification, they must contribute 25 hours of volunteer service and 12 hours of continuing education each year after becoming certified.

## Results

### Water Wise Youth

Water Wise Youth conducted a mural contest with the winning murals painted on the rainwater tanks in City Park. The youth helped local artists paint the tanks during Water Awareness Month.



- Eighty-one classes were taught reaching 1,829 students.
- 15<sup>th</sup> annual water conservation Poster Contest, *“It’s All in a Water Wise Day!”* Students in grades 3-6 from six Sierra Vista area schools submitted 406 posters with winners posted on the Water Wise website.
- *“Celebrating Cochise County’s Water Story,”* honoring Arizona’s Centennial and the first annual photo contest was held at Joyce Clark Middle School.
- Brown Canyon Ranch Western Heritage Program for 4-5 grades in Sept.-Oct.; Water Wise provided on site activities for learning about riparian habitat, endangered species, drought tolerant plants, ecosystems and water history.

## Water Wise Community Education

The Water Wise program continues to receive wide support from the public, the press and sponsors. The success of the Water Wise program has led to strong support by the Board of Supervisors and other partners.

- The City of Sierra Vista conservatively estimates that the Water Wise program saves the Sierra Vista subwatershed 270 acre feet of water a year due to encouraging water conserving practices.
- Estimated annual water savings from ICI audits is 112,000 gallons.

Water Wise personnel conducted 54 follow up calls at least 6 months after a visit for information on recommendation implementation. On average:

- 33% of contacts implemented some or all recommendations
- 41% of contacts were unreachable
- 7% had not made any changes yet
- 19% of contacts were not able to act on recommendations because of timing issues (seasonal visitors, planting season, other).

One auditee reported: *“We really appreciate all your ideas which were really, really helpful as we knew very little about high desert plants and are excited to keep moving forward!! Thanks so much for your help!! The water wise program is awesome!!”*

165 participants from eight presentations returned evaluations rating their knowledge gain.

### Average Percent Knowledge Gain from Workshops:

- 50% Well Care
- 51% Strawbale
- 45% Pruning SV
- 42% Drip Irrigation SV
- 49% Timers
- 29% Wildlife Gardening SV
- 40% Septic Care

The newly formed **Water Wise Ambassador program** assisted the Tombstone Animal Shelter with stormwater management problems, built a rainwater system and a straw bale garden.



## Xeriscape Tours

Water Wise collaborates with the Cochise County Master Gardeners Association to conduct self-guided low water use landscape tours.



## Rainwater Harvesting Tours

Water Wise has conducted a rainwater harvesting tour in Sierra Vista for 9 years, and 3 in Bisbee. The tours show 4-5 sites to the public in July and hosts explain their systems. This year the tour in Sierra Vista featured the first rainwater system installed on a model home by one of the major Sierra Vista developers Castle and Cooke. The system was made possible by the Upper San Pedro Partnership assisted by Water Wise. Also featured was a 10,000 gallon commercial system.

## Water Wise & Energy Smart

Teachers on Fort Huachuca reported through Survey Monkey that the lessons taught by the Instructional Specialists actively engaged the students and inspired follow-up discussion and/or activities. One teacher wrote, "Students discussed what was presented in the class and stated what they were going to do when they got home." Forty nine classes were taught reaching 1,105 students. In consultation with the energy professionals on Fort Huachuca and the Building Energy Monitors, WWES staff conducted 43 energy audits, encompassing 432,472 ft<sup>2</sup>. The website had over 300 visitors from 33 states and 23 foreign countries. This, in part, reflects the wide geographical territory of our military customers.



## Master Gardeners

Accurate volunteer contribution data is not available for 2012. Volunteer hours were not being consistently entered previously. MG volunteer policy and documents have been updated and everyone is clear on future expectations. Seven of the 15 MG Associates for the 2012 have completed 50 hours each to obtain MG status.

- MG Basic Training Course- 14-week course, 17 students completed and became MG Associates
- High Desert Gardening & Landscaping Conference (HDGC), February 16-17, attended by 123 people.
- MGs staffed the Sierra Vista office and tables at farmer markets answering inquires.
- High on the Desert Gardening Newsletter developed by MG volunteers.
- Eleven Community presentations sponsored by MG in conjunction with monthly association meeting.



## Family and Community Connection Programs

### Relevance

The Cochise County Child Fatality Team states that proper nutrition, health of a parent and preventive education (specifically suffocation prevention) would decrease the number of deaths in the county. There were 380 arrests in 2011 in Cochise County related to offenses against children. The Arizona Department of Economic Security states the following, "Working with families before inappropriate parenting practices begin is essential." The 2010 Cochise County First Things First Needs and Assets report states that the majority of staff members working in the child care profession lack professional qualifications. Enriching the early years will promote the productivity of schools by giving teachers better quality students. Improving the schools will, in turn, improve the quality of the workforce (Heckman, Oxford Journals 2007). Arizona ranks fifth nationally in the rate of children with substantiated reports of abuse and neglect, almost twice the national average (US Department of Health and Human Services 2011). It is recognized that early child development has a lasting impact on a person's development, their ability to learn and their capacity to regulate their emotions over the life span (National Research Council, 2005). According to the American Academy of Child Adolescent Psychology (2007), prolonged stress results in the death of neurons that transmit to the central nervous system directly relating to diminished health.

### Response

**Child Care Health Consultant (CCHC)**- is a specially trained health professional who offers consultation, training and technical assistance to early care and education providers (including family homes) in recognizing and promoting the health and safety of children, families. CCHCs are knowledgeable about child health, child development, and health and safety in early care and education settings. This program provides a trained outreach health consultant throughout our county in certified childcare settings. The CCHC identifies and assists with provider centered concerns and issues.

**Brain Builders**- This program started in 2003 with an Arizona Department of Economic Security Grant and continues to be supported and trainings offered even in these difficult economic times. The Brain Builders program is a statewide model program for integrating early brain development in early childcare education. The 16-hour curriculum includes developmental education in: prenatal, early brain, cognitive, physical, social-emotional and adaptive development.

**Brain Waves**- was developed out of the Brain Builders program in 2010. The Brain Builders program had a waiting list and many parents, grandparents, pregnant women, fathers and other professionals asked to take these classes. Brain Waves introduces basic facts and research in early childhood brain development to raise awareness of the significant impact caregivers have on the developing child.

### Benefits

**CCHC**- Provided 85 customized trainings on health and safety, child development and nutrition (119 professionals). Conducted 155 visits to centers for technical assistance, observation and advice. Provided various community trainings to 311 participants. Reach-1,429 children and families, 222 providers, 31 childcare centers. Monthly newsletters compiled and distributed to 222 providers. CCHC Resource manual updated-250 pages (Cochise/Santa Cruz). Whitmer, Bae and Sanchez created the statewide CCHC technical assistance line where Childcare providers throughout the state call in with questions regarding health and safety issues as well as training information.



**Brain Builders-** Provided 7, sixteen hour institutes reaching 95 childcare providers from Graham, Greenlee, Cochise, Santa Cruz, Pima, and Yuma counties. Extensive recruitment for the program at meetings and other events and mailing each registered childcare provider information about the institute. Pediatric Physician referrals were made to our programs.



**Brain Waves-** Professionals (6 hour) training; parent training, shelter or community training (1-5 hours), one-on-one instruction at various events (teen maze, parent conferences) to 750 participants in 8 communities with 1-4 lessons per participant and distributed handouts at community events.



### Results

**CCHC-** Centers (31) adopted major health and safety policies and procedures in centers, changed in and outdoor playground safety. Ninety-three percent of childcare providers improved or maintained childcare assessment scores. One center reported a 60% decrease in illness related absences from previous year's data (before implementation of this program). Sixty-five of participants (n=40) will use The Collaborative Problem Solving Model when working with children.

Provider surveys show the following increase in knowledge in childcare family dining:

Question	Pre test correct	Post test correct	Overall % Increase from pre to post test in correct answers by participants
What is the maximum amount of juice a child should have in a day? (n=34)	12%	90%	650%
In family style dining all food is served by the adult care givers so children will learn how much an appropriate serving size of food is. (n=34)	18%	64%	256%

**Brain Builders-** Participants recorded techniques learned and how they used them with the children. Impacts- selections of participants (childcare providers) journals (participants entered information into a "Brain Baby" journal and were collected after a 1 to 4 week period for reflection of what was learned and changed in care-giving skills): "Every child is an individual...show love and stability (discipline and teaching, not yelling and spanking) set limits." "...show love to infants when they cry...it will make them more confident." "I've learned how to better deal with my preschool kids...and my own kids. I will be more patient and help them solve their issues." "Children need a predictable and loving environment."

Participant Pre Post testing show the following

BB4L Unit (n=71)	Pre test correct	Post test correct	Overall % Increase from Pre to Post Test in Correct Answers by Participants
Brain Development	56%	95%	70%
Prenatal Development	46%	85%	85%
Physical Development	44%	75%	71%
Social-Emotional Development	49%	75%	53%
Cognitive Development	56%	78%	40%
Average Increase			64%

**Brain Waves**-Family Support Specialists report implementing Brain Waves activities and information when working directly with families. Participants increased their knowledge on early child brain and development for children on a Likert scale by 4.4 points on average on a scale of 1 to 10. Eighty seven participants report that they will change some form of parenting skill/behavior post program.

Pre-post testing knowledge of basic child brain development facts that confirm knowledge is gained due to the program. The results are as follows:

Audience (n=750)	Overall Pre test correct	Overall Post test correct	Overall % Increase from Pre to Post Test in Correct Answers by Participant
Parents-Brain Development	34%	81%	138%
Professionals/Childcare Providers	53%	91%	72%

According to the Arizona Department of Health and Human Services there was a decrease in infant deaths in Cochise County from 2010 by 9% it remains at 2% in 2012. This may be due to the efforts put forward in the county through various collaborations including extension programs.

## Healthy Lifestyles Programs

### Relevance

According to the 2010 Centers for Disease Control Behavioral Risk Factor Surveillance System, 60% of the residents in Cochise County report that they are obese. Forty-five percent of the population in Cochise County does not exercise the recommended amount of 30 minutes per day five days a week. Only twenty-seven percent of Cochise County residents are eating the recommended amount of fruits and vegetables per day. Thirty percent of Cochise County's 0-5 year old population is considered overweight or obese. Five percent of the County's 0-5 year old populations are considered underweight that is the third highest county percent in the state (Arizona Department of Health Services 2009).



### Response

*The Supplemental Nutrition Assistance Program Nutrition Education (SNAP-Ed)*-This program dovetails into our other nutrition program and is a statewide program which links social marketing and community education to change

dietary behaviors among participants. This program trains school personnel within school districts and after school programs to incorporate nutrition education and integration of physical activities into their curriculum and daily events where parents may attend classes to assist in supporting their children. Educators also work with low income parents and child care providers to assess type and quality of food they have available in their homes/facilities. They demonstrate healthy food and teach them to structure the child care environment so as to increase opportunities for making healthy food choices and increasing moderate-to-vigorous physical activity. In Fiscal Year 2010, there were 21,014 households receiving SNAP benefits in Cochise, Graham and Greenlee Counties. That is the equivalent of 53,166 people.

The *Extension Food and Nutrition Education Program (EFNEP)* is a federally funded program designed to reach limited resource audiences, especially youth and families with young children. A series of classes is designed to assist in acquiring the knowledge, skills, attitudes, and changed behavior necessary for nutritionally sound diets and to contribute to their personal development and the improvement of the total family diet and nutritional well-being. On average, in the Cochise County EFNEP program, more than 48% of the participants indicated that they were below the poverty level. Seventy-four percent of the children reached were under the age of twelve. The United States Department of Agriculture (2012) states that better health is associated with reduced health care costs, less absenteeism from work, and less dependence on emergency food assistance.

## **Benefits**

- Evelyn Whitmer, Heather Vaughn, Emma Melo, Cynthia Aspengren and volunteers (231) presented SNAP-Ed/EFNEP outreach classes for various groups teaching 29,568 community (some participants attended multiple trainings). Staff with their programs attended a total of 8 community fairs & festivals, the County Fair as well as various meetings and food banks with an estimated reach of over 8,000 community members 10,000 educational pamphlets distributed.
- Teacher volunteers recorded changes in behavior, skills and knowledge from their students through the Program Teacher Survey with 19 responding from 23 school districts or 92% of the qualifying school districts, 20 schools, 231 teacher and 4367 students are active in our program. Cooperative Extension Arizona SNAP-Ed program is currently conducting surveys in pilot sites including Cochise County. Preliminary results have been collected from 4 random schools at the beginning of the school year and post results will be collected in May 2013.
- SNAP-0-5 year old educator presented to 30 preschool programs (512 children, 98 caregivers), 14 community classes (137 adults, 32 children), and 5 professional training (124 professionals).



## **Results**

**EFNEP-**Twenty-four hour diet recalls conducted, pre and post surveys conducted to determine behavior change.

- Pre-post test showed 93% of participants improve in one or more food resources management practices (compares prices, does not run out of food or uses grocery lists)
- 79% improved their nutrition practices (meal plans, healthy food choices, low salt, reading labels, breakfast)
- 68% showed an increase of participants using the nutrition facts labels

## SNAP-Ed- Preliminary results indicate:

- Only 23% of Cochise County participants know the correct servings of vegetables
- Only 23% know the correct amount of physical activity required per day

## Teacher survey results:

- Schools/after school-19 out of 19 teachers (approx. 570 students-average 30 students per class) spends more time on nutrition related topics because of this program.
- Before this program teachers incorporated nutrition into school activities on average 1.47 times a week. They now incorporate nutrition into school activities on average 4.15 times a week.
- Students have increased their consumption of fruits and vegetables after our program by 600% where 70% of the estimated 570 students are now eating the recommended amounts.
- Responses from teachers and students state impacts of this program. Teachers report: students are asking for fruit and vegetable celebrations; the classes have an impact on staff and how they are now modeling the nutrition and physical activities behaviors for their students. One teacher stated that the children were all eager to show their parents the recipe (demonstrated by staff) to make it at home.

## SNAP-Ed 0-5 year olds parent and child-surveys indicate that they learned the following information as a result of their training:

- 60% learned about the infant feeding guidelines
- 30% learned about food safety
- 20% learned about proper portion sizes

SNAP-Ed 0-5-parent/caregivers program participants report that as a result of this training they will do the following:

- 36% will not force children to eat a particular food
- 22% will use more "family style" dining approaches
- 15% will limit sugar intake; 15% will pay attention to portion sizes
- Teachers asked pre-school students to draw what they learned 35% drew healthy food and snacks and 64% drew healthy physical activity.

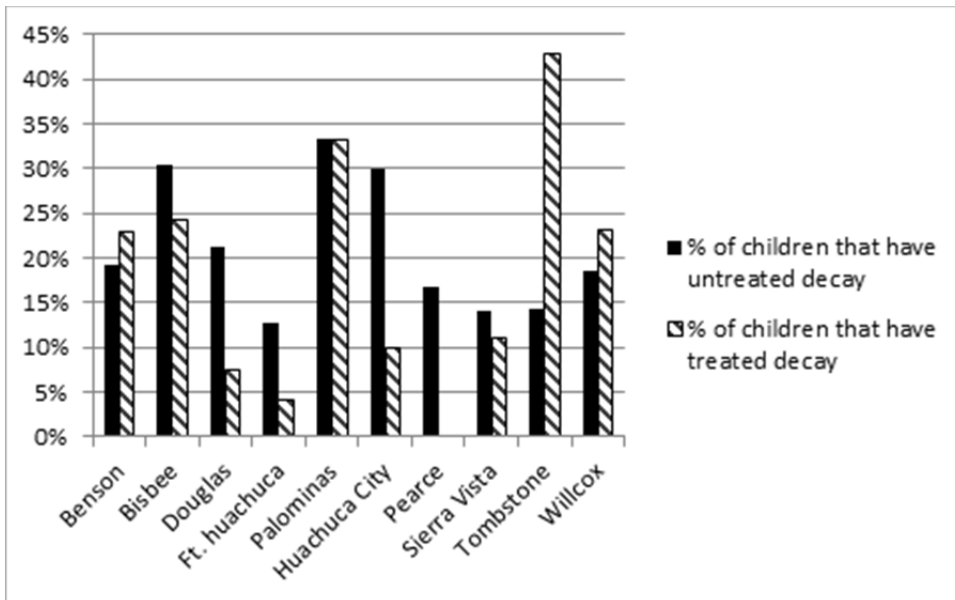


**Overall-** The Youth Risk Behavior Survey 2009 and 2011-in comparing the survey results in 2009 and 2011, the data show that the number of children describing themselves as obese in Cochise County has decreased from 12.8% to 10.8%. According to the Virginia Tech's study (Cost Benefits Analysis to Nutrition Education Programs 2009) the cost benefit ratio of \$10.64/\$1.00 therefore the potential saving due to our Nutrition Programs is \$2,299,799.

## First Smiles

### Relevance

Oral Health has been selected as one of the national Healthy People 2020 initiatives through the Centers for Disease Control and Prevention, specifically targeting persons aged two and older (2013). The Arizona Department of Health Services (2013) recommends that all childcare facilities implement oral health care education in their curriculum on a monthly basis and/or age appropriate tooth brushing programs as a requirement for reduced license fees. According to the 2003 Arizona School dental survey 64% of six to eight year old children in Cochise County have untreated tooth decay and 16% need urgent treatment for dental problems. Nationally children lose 51 million school hours per year due to dental related issues (ADHA 2007). Tooth decaying bacteria may easily be transferred to the infant before the teeth erupt and is the most common chronic disease of childhood. Oral conditions can impact health where there is a relationship between periodontal disease and cardiovascular disease as well as respiratory disease. According to the American Academy of Pediatrics (2007), only 1.8% of one year old children had visited the dentist. The Association of State and Territorial Dental Directors (2011) states that "Intervention programs, early childhood education and child care programs...have proven to be an effective method for connecting children to oral healthcare in a timely manner."



The above graph shows the percentage of children under the age of five who have tooth decay and have not been treated and the number of children under the age of five who have been treated for tooth decay in each town in Cochise County. Numbers are based on the percentage of children under the age of five who live in those specific areas who were screened by our professional.

### Response

First Smiles Oral Health Program-(Implemented March 2011) provides preventive dental health education, tooth brushing programs and fluoride varnishing to children birth to age five. This program provides education and prevention services to childcare providers/educators on the importance of preventive oral health care and how to recognize and understand oral diseases and conditions. Another component of our program is to conduct outreach

to dentists and other oral health professionals encouraging them to address the oral health needs of children birth through age five. This program has conducted a statewide train the trainer workshop to replicate this program in other counties in Arizona (Extension-Yuma, Graham, Greenlee soon to be in LaPaz and Mojave Counties).

## **Benefits**

First Smiles Provided trainings where 63 professionals and program participants were trained (including 12 centers), Providers have been trained on how to properly conduct tooth brushing with proper asepsis, amount of tooth paste and age appropriate technique for brushing. There were 6,089 children who received education and given toothbrushes, toothpaste, instruction, and preventing dental cavities. Research shows that children that brush with toothpaste with fluoride can have a median 15- 30% reduction in decay experience. Oral screenings (1493) and fluoride varnish applied to 1401 children (parental permission acquired) referral for dental needs. Research shows that fluoride varnish reduces decay experience by 20-50% depending on other fluoride sources. Other individuals reached (fairs, meetings, etc.) 400.



## **Results**

This program was highlighted by the University of Arizona as an exceptional program. The write up is at this address: <http://uanews.org/story/ua-cooperative-extension-promotes-healthy-first-smiles> Three childcare centers had a tooth brushing program at the beginning of the year, 9 centers implemented daily tooth brushing protocol with a 39% increase of children now brushing at home since the beginning of the year.

Additional Impacts: A lifetime of good oral habits may prevent gingivitis and periodontitis as an adult. Children who may have been afraid of the dentist have learned to trust us and now are able to have a dental screening. Numerous children who have had dental decay at their first screening have had the teeth restored. When asked if participants brushed their teeth two times per day 95% stated that they did. According to the National Institute of Health, on average Americans spend \$31,341.32 on dental work over a lifetime. According to the Centers for Disease Control and Prevention the amount can be reduced by 40% with preventative care before the age of one, lowering this amount to \$18,804 spent on dental work over a lifetime, a savings of \$12,537.32 per child. In Arizona, 2,878 children in the First Smiles program report receiving services or having dental care after our program which equates to the potential savings of \$36,082,406.96 for those 2,878 Arizona children over a lifetime.

**Scholarly Products Developed** “How to Select a Pediatric Dentist,” #AZ1575, “Tooth Decay in Young Children and How to Prevent it!” #AZ1574. Home provider’s manual was developed and is given out to participants in the First Smiles program. First Smiles video was developed to create awareness, promote program and to educate the population.



Professionals- surveys show the following increase in knowledge:

Question (n=35)	Pre test correct	Post test correct	Overall % Increase from Pre to post test in correct answers by participant
In Arizona, about ___ of all children have a cavity by the age of 3? (1/3)	17%	86%	406%
By what age should children first see a dentist? (1)	46%	89%	94%
Tooth decay is a contagious disease. (True)	27%	93%	245%
Because children lack the manual dexterity, adults should brush children's teeth until ___ years of age. (6-7)	23%	89%	287%
Overall average increase of 9 questions asked			137%



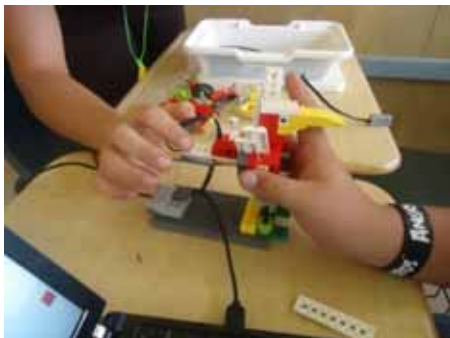
## 4-H Science

### Relevance

In 2009, Arizona ranked 45th in science education and 34th of 39 ranked in fourth grade science scale scores, <http://www.statemaster.com/>. At the same time, the 2009 Arizona Workforce Informer identifies Professional, Scientific, and Technical Services as the largest employment area in Cochise County and the second largest growth area for future employment. The national 4-H Science (formerly SET) Program forms part of the long-term solution for improving science literacy and aptitude of America's youth. 4-H has a national movement to address this critical challenge by preparing 1 million new young people to excel in science, engineering, and technology. The local focus collaborates with schools that have science, technology, engineering, and math objectives and enhance educational opportunities for youth via 4-H curriculum and materials.

### Response

- Lego WeDo Robotics Education at: Clawson Elementary Summer After Care, Joe Carlson, Faras, Sarah Marley and Clawson Elementary School after school, Bisbee Boys & Girls Club, Fort Huachuca School Age Services, Sierra Vista Day Camp -- 133 youth received 6 hours of instruction. (86% Hispanic, 9% Multi-Racial, 2% White, 2% Asian Pacific)
- Benson Middle School Science Day (3/09) -- 89 youth received instruction in plant germination. (11/19) -- 111 youth received instruction in watersheds and water conservation.
- Cochise College STEM Exploratorium (4/27)-- 101 youth received instruction in plant science.
- Douglas Summer Science Camp -- 18 youth received 18 hours of instruction over three weeks between robotics, technology, gardening, rainwater harvesting, nutrition, and rocketry and journaled 52 newly acquired science and technology vocabulary words and 29 science content skills over the three day experience. (83% Hispanic, 17% White)
- Educators from Cochise County attended the Summer Institute for Teachers on the Integrated Youth Gardening Curriculum (6/18)
- Joe Carlson Elementary School (Douglas) trained in the Integrated Gardening Curriculum and estimated implementation of the lessons with 457 elementary students grades K-5.



## Results

**Lego WeDo Robotics** programming was evaluated using the Arizona Life Skills Assessment Tool (IRB approved). This pre and post survey was used with third through fifth grade youth to assess their changes in knowledge, skills, and science perceptions as shown:

Knowledge Indicators:	Pre	Post	% Gain
I know how to build a robot	1.4	2.5	79
I know how to use the computer to program a robot	1.4	2.6	86
Skill Indicators:			
I would have friends that are different than me	2.0	2.7	35
I ask for help if I do not understand something	2.1	2.6	24
I do what I say I am going to do	1.8	2.5	39
I ask permission before I use other people's things	2.3	2.8	22

## STEM Day

Benson Stem Day (3/09)	Pre	Post	% Gain
Knowledge of plant germination	2.4	3.1	29
Qualitative responses included; "you don t need a garden to grow stuff", and "a plant needs water, soil, and light".			
Benson Stem Day (11/19) (1=low, 4=high, N=111)			
Knowledge of watersheds/water conservation	2.5	3.2	28
Qualitative responses included; "Save water by finding where water pools", "You can save so much water and use it for so many things!"			



## Summer Institute for Teachers

Indicators (1=low, 5=high) N=21	Pre	Post	% Gain
Watersheds	3.3	4.3	29
Rainwater harvesting	3.0	4.3	43
Water cycle	3.6	4.3	19
Plant needs	2.8	3.7	30
Pest management	2.0	3.0	50
Soils	2.2	3.3	50
Planning nutritious meals	3.3	4.0	12
Plant parts	3.3	3.7	10
Serving sizes	3.0	4.3	33

## Joe Carlson Integrated Gardening Curriculum Workshop

Indicators (0=low, 4=high, N=19)	Pre	Post	% Gain
parts of the plants we eat	2.16	3.26	51
rainwater harvesting	1.21	2.84	135
pest management	0.95	2.47	160
watersheds	0.95	2.89	204
straw bale gardening	0.37	3.05	724
Participants cited "We can incorporate these lessons throughout all the subjects" as a key concept learned at the training			

## Leadership and Citizenship

### Relevance

Across the United States, 4-H residential camping programs differ. However, outcomes of these programs show life skill development in areas such as: (1) making new friends, (2) cooperation, (3) accepting differences, (4) responsibility, and (5) teamwork (Garst & Bruce, 2003; Arnold, Bourdeau & Nagele, 2005; Thurber, et. al., 2007). Specifically, research has shown that youth who serve as camp counselors gain skills such as leadership, responsibility, teamwork, decision making, social and group facilitation skills (Brandt & Arnold, 2006; McNeely, 2004; Duda, 2009). Leadership, Education and Adventure for Pre-Teen (LEAP) Camp invites Cochise, Santa Cruz, Graham, Pima and Greenlee counties to two intensive counselor trainings (one in January, one in November) that take place prior to camp. Camp counselors plan, organize, and instruct the sessions at camp.



### Response

- January and November LEAP Camp Counselor Training for 17 diverse youth from multiple counties. 32 hours, 65% White, 35% Hispanic/Multi-Racial
- February LEAP Camp for 59 diverse participants from multiple counties. 3 days, 58% White, 24% Hispanic, 18% Multi-Racial

### Results

Upon the close of camp counselor trainings, participants complete Arizona Life Skills Assessments (IRB approved).

#### Camp Counselor Trainings

Indicators (1=low, 4=high)	Pre	Post	% Gain
Organize a group to reach its goal	2.2	3.3	50
Use different leadership styles	2.2	3.4	55
Contribute as a member of a team	2.7	3.6	33
Understand it is important to follow through on commitments I have made	2.8	3.9	39

With LEAP Camp's technology theme, the Life Skills Assessment also measured content acquisition. The following chart outlines the results.

### LEAP Camp

Indicators (1=low, 4=high) N=59	Pre	Post	% Gain
<b>Knowledge Indicators</b>			
I know how to use PhotoShop	1.6	2.7	69
I know how to use Animoto	1.5	2.8	87
I know how to use Voki	1.6	2.7	69
I know how to use Windows Movie Maker	1.7	2.6	53
<b>Skill Indicators</b>			
I can teach others to use PhotoShop	1.4	2.3	64
I can teach others to use Animoto	1.5	2.5	67
I can teach others to use Voki	1.5	2.6	73
I can teach others to use Windows Movie Maker	1.4	2.3	64



## Financial Management and Workforce Development

### Relevance



Many families are facing catastrophic financial conditions in America. Yet each year, young American's spend roughly \$150 billion, even though they do not have a strong understanding of basic financial concepts, such as, savings, investments, annual percentage rates, inflation and interest (State Farm, 2007). In fact, 66% of high school seniors failed the 2004 survey on personal finance (AZ School Standards, 2005). According to Kids Count! Arizona (2006) and The Population Reference Bureau (2003), of the 1.4 million children living in Arizona, the key indicators for child well-being reports that 20% of children under the age of 18 live in high poverty situations, 34% in single parent households, 11% of teens do not attend school and do not work and 35% of Arizona children are living with parents/adults who do not have full-time employment. Cochise County Workforce Development,

Sierra Southwest, Professional Youth Quest, and other local organizations, formed a sub-committee in Sierra Vista around these issues in 2010, the Take Charge America Institute, Financial Economics and Family Education (FEFE) program out of the Norton School provided resources and direction for the program.

### Response

Six hours of instruction in the Launch into Life program was implemented with the following schools: Benson High School (4/16) 93 ninth grade youth. Bisbee High School (4/26) 89 ninth grade youth. Buena High School (Sierra Vista, 3/20, 9/18) 73 youth grades 10-12.

## Results

Using the Arizona Life Skills Assessment (IRB approved), students (N=246) responded to 19 quantitative Likert Scale (1=low, 4=high), and three qualitative indicators. The retrospective survey reported:

Knowledge Indicators:	Pre	Post	% gain
Understand expenses associated with pursuing higher education	2.4	3.3	38
Identify appropriate clothing attire for various job interviews	2.6	3.4	31
Skill Indicators:			
Create a personal resume	2.2	3.3	50
Plan a budget of monthly expenses	2.2	3.2	45
Calculate federal, state, and FICA taxes from a pay check	2.0	3.3	65
Apply for a job	2.5	3.5	40

## Healthy Lifestyles

### Relevance

According to recent studies by the Centers for Disease Control and Prevention, nearly 18% of Arizona children are obese, with the rate of childhood obesity in Arizona rising from 12.2% in 2003 to 17.8% in 2007, faster than any other state. Douglas, located in Cochise County, is a small community (population 17,000) on the US/Mexico border with a high rate of poverty. Nearly two-thirds (62%) of its population falls below 200% of the Federal Poverty Level. Douglas is also poised to replicate the model program, Tucson Village Farm, locally near the school district.

Strategic goals of Arizona Extension, pertaining to youth development, are to “Enhance leadership and citizenship of youth,” “Connect youth with the outdoors,” and “Assist youth to become physically healthy.” This program incorporates an evidence-based youth leadership program developed by Healthy Kids in Action, called Students Taking Charge, with hands-on learning experiences at two local seed-to-table educational farms in Cochise and Pima Counties. Students Taking Charge engages youth positively in wellness efforts by helping them find a voice and vehicle to effect change in their schools and communities through activities encouraging participatory learning, decision-making, critical and creative thinking, cooperative learning, leadership, and communications skills around healthy lifestyle education, physical activity, and gardening. Funding for this program comes from a grant from Children Youth and Families at Risk (CYFAR).

### Response

- Information sharing booth at Douglas Care Fair (8/4) which reached 203 individuals
- Educational booth at Cochise County Fair (9/27-9/29) in Douglas which reached 744 youth and adults
- Educational booth at Lights on Afterschool (10/18) at Fort Huachuca to pilot test youth activities for 103 participants
- Recruiting at Douglas High School (11/15) for 20 participants
- Recruiting at LEAP Camp Counselor Training (11/17) for 10 participants
- CYFAR youth meetings (11/27) for 20 participants
- CYFAR youth team building at high ropes course (12/12) for 10 participants

### Results

The program started in July of 2012. A pre-test was taken in fall 2012 for baseline data, but no other evaluative information is available at this time.

## Connecting Youth with Science, Technology and the Outdoors

### Relevance

Nationwide only 18% of high school seniors are considered proficient in science (National Assessments of Educational Progress, 2005). Only 32% of current U.S. college graduates are earning bachelor degrees in Science & Engineering fields, compared to 63% in Japan and 53% in China (Science and Engineering Indicators: 2010, published by the National Science Board). At the same time there is an urgent need to re-connect young people with the outdoors and with the immediate environment. As Richard Louv (author of Last Child in the Woods) stated: we must "save our children from nature-deficit disorder." Youth understanding of and appreciation for science, engineering, and technology, as well as a connection to the outdoors, and their capacity to utilize related knowledge, skills, and abilities in their lives presents a critical opportunity for Extension.



### Response

Thirty-six students from across the state attended the Natural Resource Conservation Workshop for Arizona Youth (NRCWAY). The workshop theme was natural resources basic sciences. Teams of students incorporated what they learned during the week as they collected and analyzed data from their group projects. Fourteen youth participated in a week long Media Camp exploring digital photography and movie making in an outdoor, natural setting.

### Results

**NRCWAY** – Students demonstrated their ability to acquire, process, and interpret data through completion and presentation of natural resources basic sciences group projects. Participants indicated that they plan to make at least one change or take action such as: do more volunteer work with the environment, practice using topographic maps, save more water, respect wildlife habitat, etc.

**NRCWAY** – change in participants understanding of knowledge on a five point scale with 5 = Excellent and 1 = Poor. Surveys returned = 11.

Topic	Before Mean	After Mean	% Increase in knowledge
Feeling connected to the natural environment	3.45	4.09	19
Enjoying the freedom of being outside	3.91	4.55	16
Comfort in the outdoors	4.07	4.73	16
My desire to spend time outdoors	3.82	4.36	14
Liking nature	3.91	4.45	14
Interest in pursuing a career in natural resources	2.64	2.80	6

**Media Camp** – When participants were asked “What is the most significant thing you learned?” responses included: learned about all the settings on my camera, rule of thirds, F-stops and shutter speeds, how to take better pictures, editing, and to save their work often. Fifty percent of participants plan to make at least one change or take action, such as: use custom settings, rule of thirds, take more photos and practice more, and be more creative.

**Media Camp** – change in participants understanding/level of knowledge on a five point scale with 5 = Excellent and 1 = Poor. Surveys returned = 13.

Topic	Before Mean	After Mean	% Increase in knowledge
ISO, shutter speeds, aperture	2.23	4.08	83.0
Rule of thirds	2.46	4.38	78.0
Depth of field	1.92	3.31	72.4
Golden triangle	2.08	3.31	59.1
Lighting	2.54	3.92	54.3
Rules of composition	2.31	3.54	53.2
Macros	2.69	4.08	51.7
Use of a tripod	2.92	4.08	39.7
Use of Premier, n = 8	2.00	3.75	87.5
Use of Photoshop, n = 10	3.20	4.40	37.5



## Engaging Youth in Building Knowledge and Life Skills

### Relevance



4-H Youth Development occurs from an intentional process that promotes positive outcomes for young people by providing opportunities, caring relationships and support. 4-H uses many different projects and opportunities to engage youth in areas of interest. These projects not only guide youth to acquire new work and family life skills but become the “vehicle” through which to maximize youth development – of the Five Cs: competence, confidence, connection, character, and caring.

Nationally, employers report that more and more high school graduates lack the skills needed for work. We have moved from the industrial workplace based on manufacturing of the early

1900’s to service economy based on information, knowledge and innovation. Between 1995 and 2005 the U.S. lost 3 million manufacturing jobs, according to the U.S. Bureau of Labor Statistics. In that same time period 17 million service-sector jobs were created. To be “educated” for the workforce of today requires mastery of core subjects and 21st century skills such as: learning and innovations skills; information media and technology skills; and life and career skills (Partnership for 21st Century Skills, 2008). In an ever changing world our youth need better knowledge

and tools to prepare them to compete in the global economy. The Common Core State Standards (<http://www.corestandards.org>) adopted by Arizona and most states are being designed to not only improve what students learn, but how they learn by teaching critical-thinking, problem solving, and effective communication skills. The desired outcome is to ensure that students are effectively prepared for college, career, and life.

The “Big Three” features of effective youth-serving programs (Lerner, 2004; Blum, 2003; Roth & Brooks-Gunn, 2003) are: 1) Positive and sustained relationships between youth and adults; 2) Activities that build important life skills and 3) Opportunities for children to use these life skills as both participants and as leaders in valued community activities. Research over the past five years has shown that 4-H clubs provide youth the opportunities, supports and relationships needed to develop skills and abilities to become contributing members of society (Tufts University Longitudinal Study of 4-H). The fundamental 4-H ideal of practical, “learn by doing” experiences encourages youth to experiment, innovate and think independently. Active participation in 4-H provides the training, practice, and leadership opportunities needed for youth to develop life skills.

## Response

Youth are provided integrated, experiential learning opportunities club meetings, judging events, demonstration days, officer/leadership workshops, activity days, shows, and quality assurance and project area workshops. Livestock shows provide a unique educational experience for youth development. Caring for an animal requires responsibility and determination. Many youth begin learning positive life skills, including responsibility, at an early age. The annual county fair is an opportunity to highlight the many youth accomplishments and showcase the knowledge and skills youth have gained.

4-H is a **community** of young people across America who are learning **leadership, citizenship and life skills.**



## Results

**Life Skills:** A year end evaluation was completed by county fair participants. Participants were asked "How much, if any has your experience as a 4-H member influenced the following?" The mean scores show that 4-H has been moderately to highly influential for all life skills listed. Similar results were obtained the previous year +/- 0.1 to 0.2 in all categories except for "make a presentation." The mean rating for presentations in 2011 was 3.4 and in 2012 it was 3.9 – an increase of 12.8%. This increase coincides with the implementation of mandatory demonstrations in order to exhibit at the county fair.





**LIFE SKILLS:** Influence of 4-H on the following life skills on a five point scale with 5 = essential to 1 = Not influential. Surveys returned = 171.

Life Skill	Mean
Gain new skills	4.1
Accept responsibility for doing a job	4.0
Make a presentation	3.9
Develop confidence	3.9
Develop sportsmanship	3.9
Develop self-discipline	3.9
Set goals and then work to achieve them	3.8
Contribute as a member of a team	3.8
Ability to relate to others	3.8
Ability to solve problems	3.8
Self-motivation	3.8



**Economic Impact of Market Livestock Projects:** 4-H members invest money into the development of their projects, and these expenditures can provide a basis to begin to quantify some of their 4-H contributions to the economy. Market livestock summary data was collected from 4-H projects to get an estimate of the direct spending of participants into the local economy. IMPLAN software was used to analyze the contributions.

	Beef	Sheep	Goat	Swine	Total
Number of Market Livestock Projects	25	24	20	104	173
<b>Total Expenses Reported (Direct Impacts)</b>	\$59,203	\$7,692	\$6,296	\$52,046	\$125,237
<b>Total Countywide Impacts (Direct, Indirect and Induced Impacts)</b>					
Output (Revenue)	\$89,058	\$10,378	\$8,666	\$71,221	\$179,323
Total Value Added	\$46,461	\$6,565	\$5,702	\$46,343	\$105,071
Labor Income	\$26,372	\$3,369	\$3,055	\$24,534	\$57,330
Other Property Income	\$11,680	\$2,240	\$1,730	\$14,552	\$30,202
Indirect Business Tax	\$8,410	\$956	\$917	\$7,256	\$17,539
Employment (Full-time or Part-time Jobs)	1.2	0.2	0.1	1.2	2.7



**Market Livestock Sales:** A second analysis was to look at trends in giving through livestock auctions over the last ten years. The main purpose for obtaining a market animal is for educational purposes, any monetary gain is an additional benefit. Many of the project members use additional monies received to finance their next year’s project or put into savings for their college education. A major marketing effort was conducted to increase sales; however, time will tell if the jump in prices was due to the marketing effort or good farm commodity prices, or a combination. Below is total sales dollars, not including add-on contributions.

Year	\$ Amount	Year	\$ Amount
2002	109,881	2008	173,179
2003	135,272	2009	140,294
2004	161,385	2010	111,258
2005	152,096	2011	155,771
2006	184,179	2012	<b>288,690</b>
2007	155,054	<b>11 year Total</b>	<b>1,767,059</b>



**Officer Training:** When participants were asked "What is the most significant thing you learned?" responses included: how to better serve the members, proper parli-pro, how to run a meeting, how to start a committee, and how to do my officer position. Forty-five percent of participants plan to make at least one change or take action such as: change the way I organize my records for club funds, write more thank you letters, make sure all members participate, have mentors for younger members, let the members run the meetings, and encourage all members to participate in the meetings.

**OFFICER TRAINING** - change in participants understanding/level of knowledge on a five point scale with 5 = Excellent and 1 = Poor. Surveys returned = 29

Topic	Before Mean	After Mean	% increase in knowledge
Basic principles of parliamentary procedures	2.5	3.7	48.0
How to conduct a business meeting	2.6	3.8	46.2
Roles and duties of my 4-H officer position	3.3	4.2	27.3
Ability to make leadership decisions	3.2	4.0	25.0
Ability to encourage others to speak before the group	3.2	4.0	25.0
Points of a 4-H meeting	3.3	4.0	21.2
How to do a demonstration	3.7	4.4	18.9



## Land Use Planning, Sustainable Development and Economic Development

### Relevance

The Community Resource Development position was created in 2007 to help address the broader issues of rural development and impacts. The Morrison Institute for Public Policy at Arizona State University projects Arizona's population to reach over 8 million people by the year 2030. Where and how these new residents will be accommodated becomes an important issue for planners and decision makers everywhere in the Interior West. Census 2010 data shows that Arizona has grown by nearly 25% in the last decade – the second fastest growing state in the nation behind Nevada in spite of high mortgage foreclosure rates and an economic downturn, with a population of nearly 6.4 billion people. Cochise County has grown to more than 131,346 people according to the census – an 11% increase from the year 2000. Despite the increase in residents, the County still falls below the state's average median income level with a median income of just under \$44,000 (\$48, 711 for the state). Moreover, according to the 2010 Arizona Agricultural Statistics Bulletin, between 2007 and 2010, while the amount of land in farms has held steady, the number of farms in Arizona dropped by 100, indicating a trend of fewer farmers.

With Arizona's increasing population and loss of farmers, "business as usual" will not be sustainable in terms of land use, energy, and food production. This program incorporates education and outreach activities around the issue of sustainable development, defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs," especially as it relates to land use practices, zoning, local food systems, and renewable energy options.

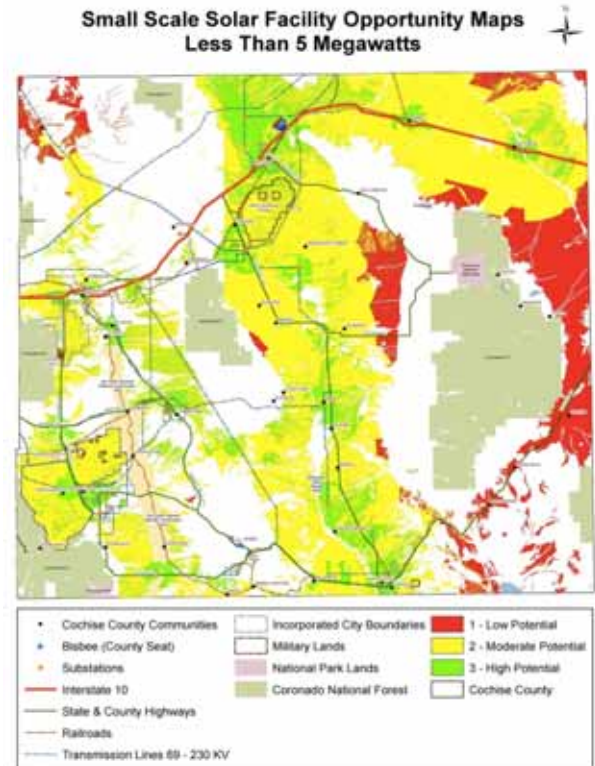
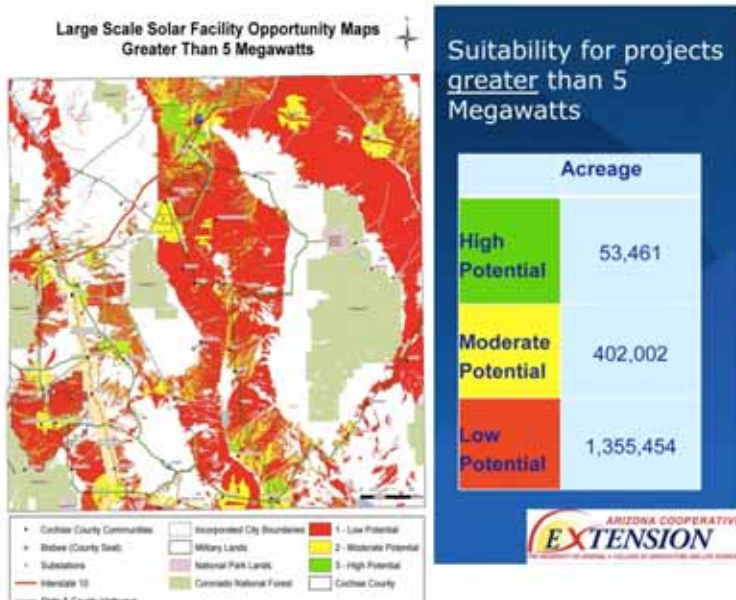
Overall, the primary purpose of this program is to bring high quality information regarding land use planning, zoning, regulatory frameworks, land conservation options, economic development, sustainable design and sustainable development concepts to rural decision makers, small acreage land owners, developers, ranchers, concerned citizens, economic development interests, and school districts.

### Response

The following are activities in these programs that occurred in Cochise County during calendar year 2012.

- Conducted Small Acreage Land Owner Assistance workshops for residents in Cascabel in July of 2012.
- Presented workshops Fundamentals of Land Use Planning and Sustainability to residents of Cascabel in June and August of 2012.
- Conducted Placemaking workshop with the City of Sierra Vista Planning Commissioners as a precursor to the update of their General Plan.
- Collaborated with UA School of Planning and Landscape Architecture to develop a GIS-based land use suitability analysis tool for the installation of utility-scaled solar facilities. An analysis was conducted for the entire 6200 square mile jurisdiction of Cochise County. The Renewable Energy Opportunity Analysis (REOA) for Cochise County was presented to the Cochise County Planning Commission in April, 2012. The analysis and results pertaining to the Benson area were presented to residents as well in 2012.
- A video presentation of the Renewable Energy Opportunity Analysis for Cochise County was developed by Cochise County Extension and shown at the 2nd International Trade Conference, sponsored by SEAGO at Cochise College in May of 2012.

- The Az Citizen Planner 101 online course, adapted from Michigan State's American Planner Institute and in collaboration with the Az Planning Association, was launched in April as a resource for planning commissioners around the state. This 10-hour course, adapted through the leadership of Cochise County Extension, teaches the role and authorities of planning commissioners per Arizona statutes and the nuts and bolts of developing comprehensive and general plans for their respective jurisdictions, including the importance of public participation.



## Results

Approximately 60 people participated in this program's workshops in Cochise County in 2012, with some participants attending more than one workshop.

Evaluations for the Fundamentals of Land Use Planning and Sustainability workshops indicated that participants found the workshops to be 'valuable' or 'very valuable.' Many attendees noted an increase in their knowledge of lot splits versus subdivisions. In addition, one respondent noted that they will look into consolidating previous lot splits and another noted that they will now do further research on allowable uses and minimum lot sizes before purchasing property. Attendees noted a range of things they will pursue as a result of the sustainability workshop, such as driving less and looking into alternative energy.

Participants in the Small Acreage Assistance for Land Owners workshop (2 days) were taught the technique and importance of inventorying and mapping resources including the natural and physical aspects of their property. In addition, their ability to set goals for their property was enhanced by a more thorough understanding of their human and financial resources, as well as natural and legal constraints.

Don Brush, Community Development Director for Sierra Vista said this about the Placemaking workshop: "For a commission generally focused reactively on development applications, the workshop was eye-opening and will likely result in positive change in the city's next general plan. That general plan update process has begun with a visioning

**Small Scale Solar Potential Acreage**  
 Low Potential - 281,081 acres  
 Moderate Potential - 1,185,982 acres  
 High Potential - 343,879 acres

This is not a survey product. This information is derived from various national, state and county GIS databases. The University does not assume any liability for damages arising from errors, omissions, or use of this information. Users of this map are advised to be aware of the locational accuracy, data collection dates, compilation methods, and cartographic format.

Map Author: Melissa Clevins 02/12/12  
 Map Date: 02/12/12  
 Data Sources: State of AZ, Cochise County  
 Contact: mclewis@arizona.edu  
 Web Page: www.arizona.edu

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effort that will run through March of 2013 and eventually conclude with a re-write of the plan and voter approval in November of 2014. The Placemaking Workshop stimulated thought processes that have already surfaced in a focus group meeting that the city held and which included two commission members."

The chairman of the Cochise County Planning Commission successfully completed the Arizona Citizen Planner 101 online course in 2012. The course continues to be promoted to commissioners and local elected officials throughout the county and state.

The results of the Renewable Energy Opportunity Analysis (REOA) for Cochise County are now being incorporated into city and county Geographic Information Systems (GIS) so that planners will have immediate access to maps showing areas of low, moderate or high potential for the construction of utility-scale solar facilities throughout their jurisdiction. This is useful in that planners are better equipped to evaluate any utility-scale facilities that may be proposed by solar developers. The data provided can tell planners whether or not a specific solar development application is appropriate or not based on its proposed location. For example, in the Cochise County Planning Commission's report of April 23, 2012, County staff cited the REOA solar facility analysis for the county, as a factor for approving a 1.2 megawatt solar photovoltaic project proposed by Sulphur Springs Valley Electric Cooperative in San Simon, Arizona. The facility is projected to off-set 2,520 metric tons of carbon dioxide emissions that would otherwise be produced by fossil-fuel based generation plants. The analysis Extension conducted was cited again by county planning staff in December 2012 in their report to the Commission to extend the approval time-frame for a 200 megawatt solar installation south of Bowie.

The REOA results are also being used by the Southeastern Arizona Economic Development Group (SAEDG) to promote solar development in Cochise County. The results have been shared by SAEDG with Solar Path, a solar company in Oro Valley and will be presented in a solar forum in 2013.



Image source: NREL

## Renewable Energy Opportunity Analysis Summary Report

Solar Facility Siting Analysis for Cochise County, Arizona  
April, 2012



Prepared by Cochise County Cooperative Extension with the University of Arizona School of Landscape Architecture and Planning for the Cochise County Planning Department



