

# ARIZONA LAND & PEOPLE

Volume 51

Number 1

**Historic Iraqi Date Palm**

**Burrowing Owls**

**Evacuating Pets**

**Park Avenue "High Rise"**

**Dynamic 4-H Leader**

**Rainforest Greening**

**Hopi Farming Survey**



College of Agriculture and Life Sciences

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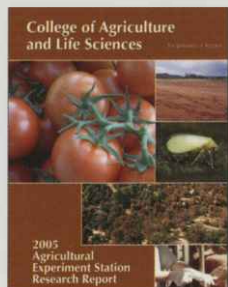
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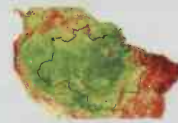
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# Making a Home in the Desert

## Burrowing Owl Ecology and Conservation Studies

By Joanne Littlefield

At dawn and dusk they wing their way through the desert, tracking small prey. During the day they can be found chasing down grasshoppers or beetles, or posted as sentinels outside their nesting burrows. Although small in size, burrowing owls (*Athene cunicularia*) are helping to answer big questions researchers have about avian migration. Once a purely migratory species, many of these eight-inch birds are now making themselves at home year-round in the desert grasslands, golf courses and agricultural fields of the Southwest. Their petite size and unusual nesting habits make them interesting wildlife for both urban and rural residents to watch.

Courtney Conway, a research biologist in the Arizona Cooperative Fish and Wildlife Research Unit, part of the School of Natural Resources in the UA College of Agriculture and Life Sciences, has been studying the ecology and conservation needs of burrowing owls throughout the western United States for the past seven years. He has devised reliable methods of estimating their populations, examined the birds' use of artificial nesting boxes on golf courses, and has directed graduate and undergraduate students as they study the birds' food and nesting habits. These studies focus on the factors that influence nest site selection and reproductive success.

"Here in Arizona we have burrowing owls that are migratory and we have owls that are year-round residents within the same population," Conway says. To find out more, Mark Ogonowski, one of his graduate students in natural resources, is conducting a food supplementation experiment by placing food at some nests and withholding it at others. He wants to find out what influence, if any, food availability has on the decision each individual owl makes either to migrate south for the winter or stay in Arizona. In another study, graduate student Alberto Macias Duarte is using genetic markers and other molecular biology tools on blood and feather samples from burrowing owls at different latitudes



Courtney Conway

throughout their breeding range, to provide pieces to the migration puzzle. As one of the more visible owls, they are fairly easy to catch for banding and sampling.

"You can put leg bands on them," Conway says.

"It's very easy to observe those leg bands because the owls stand out in front of their burrow for a good portion of the day."

Burrowing owls have historically colonized abandoned prairie dog and ground squirrel burrows. The decline of prairie dog numbers has led, in part, to an adjustment in the owls' traditional nesting habits.

"They've been very successful at colonizing in other areas," Conway says. "They're very common in human-dominated landscapes." These include airports, golf courses and crop fields.

More than 100 years ago biologists noted that burrowing owls had what seemed to humans to be an odd behavior of gathering mammal manure, shredding it, and lining the nest burrow with it, including the entrance. Their nest chamber is typically ten feet or more underground. Lining it with manure is labor-intensive for the tiny birds.

"It just kind of begs the question of why in the world would they go through this effort to bring manure around their eggs and nestlings," Conway says. "It's very odd in a sense that many other birds want to hide the location of their nests. By bringing all this manure back and shredding it up, it's making the nest more obvious." In fact it's one of the ways that researchers know that a hole in the ground is actually a burrowing owl nest.

Because burrowing owls are primarily associated with urban and agricultural settings, they've been known to use horse, cow and domestic dog or coyote manure. Conway, graduate student Matt Smith and undergraduate Chris Nadeau have been investigating theories for this choice of nest lining, including whether it might be to attract food, to aid in water absorption during heavy rains or to serve as a signal to other owls. Conway suggests that

nest lining may be a way to let other owls know that “the nest burrow that they’re in is occupied and ‘don’t dare come down this burrow.’”

Because they eat insects, the owls may also be providing a fast-food alternative for their nestlings. The manure that lines the burrows attracts insects that the nestlings can eat. The added advantage is that the baby owls can feed in the safety of the burrow in case a predator approaches, so that when they’re first learning how to forage they don’t have to go far from the nest.

While burrowing owls are listed as an endangered species in Canada, in the United States they are considered a nationally designated “bird of conservation concern.” According to Conway they appear to be most in danger at the northern part of their distribution, including Canada, Montana, North and South Dakota and Washington, although they are also endangered in the northeastern corner of their range in Nebraska and Iowa.

“Birds that used to make the trip to points north in the summer may be taking up residence in the lush habitats associated with agricultural fields and urban areas in the desert,” Conway says. Conservationists are looking for ways to keep burrowing owls off the endangered or threatened lists. Efforts include Conway’s research, along with research by the Arizona Game and Fish Department and projects by volunteer groups such as Wild at Heart who are helping to construct artificial burrows in habitat areas impacted by development.

In more urban settings, golf courses attract herbivores, insects and small rodents, providing a food source for the owls. A grant from the U.S. Golf Association drew Conway to the state of Washington to work with golf course superintendents and grounds crews there.

“The golf industry saw this as a potentially good opportunity to help some conservation efforts while at the same time attracting some cute wildlife to their golf courses,” he says. Conway and his team installed 150 artificial burrows, placing them in different locations, from right in the rough near the fairways, to areas close to tee boxes and to others further away, just outside the maintained areas. These efforts paid off—the burrows got some takers. The owls prefer open areas that have low vegetation, avoiding even tall grasses or shrubs.

“We found that they did not use nest burrows that were close to sprinkler heads,” Conway notes. “They preferred to be off into the arid, native vegetation adjacent to the golf course.” He is applying the information gleaned in Washington to see how it applies in other parts of the owl’s range, including nesting sites in central Arizona near agricultural fields and the Grande Ruins National Monument, in urban areas of Tucson and in agricultural areas in California’s Imperial Valley, near the Salton Sea.

Because maintenance workers typically apply pesticides and herbicides to keep golf courses in top form, there is a concern about attracting burrowing owls to these areas. Conway and his research team have been on the lookout for increased deformities and even mortality among the nestlings. The researchers haven’t seen any deformities but they have noted some reduced success in reproduction.

“It’s certainly something that needs to be addressed before golf courses throughout North America would want to encourage burrowing owls to nest on their grounds,” Conway says. ■



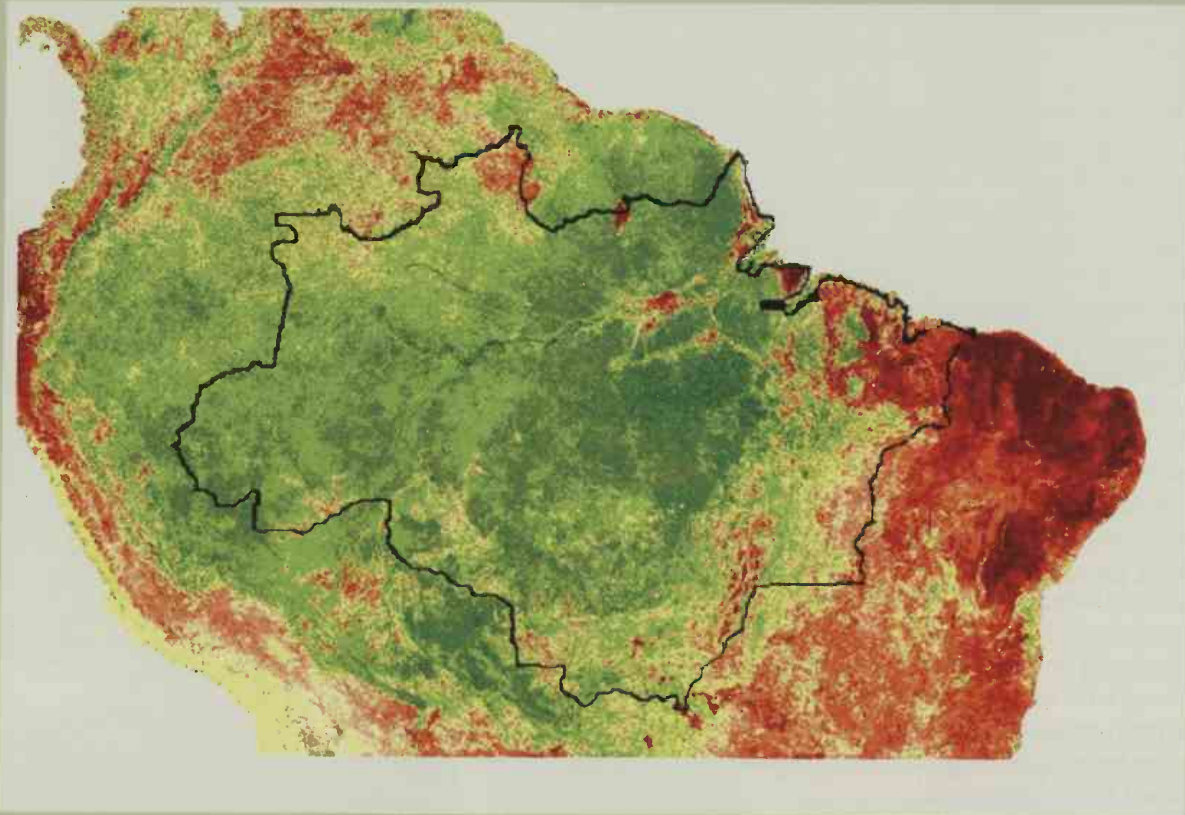
Burrowing owl nestlings



Artificial nesting burrows in foreground have been placed near agricultural fields and encroaching development.

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In this image of South America, green indicates vegetation that is growing during the dry season. Red and orange indicate "browning down" in the dry season. The boundary of the Amazon rainforest is shown in black. Red areas within the boundary are places where the primary forest has been disturbed.

# Amazon Rainforest Greens Up in the Dry Season

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By Mari N. Jensen  
UA Office of University Communications

**T**he Amazon rainforest puts on its biggest growth spurt during the dry season, according to new research.

The finding surprised the researchers.

"Most of the vegetation around the world follows a general pattern in which plants get green and lush during the rainy season and then during the dry season, leaves fall because there's not enough water in the soil to support plant growth," said lead researcher Alfredo R. Huete, a professor of soil, water and environmental science in the UA College of Agriculture and Life Sciences.

"What we found for a large section of the Amazon is the opposite. As soon as the rains stop and you start to enter a dry period, the Amazon becomes alive. New leaves spring out, there's a flush of green growth and the greening continues as the dry season progresses."

The finding holds true only for the undisturbed portion of the rainforest. Areas where the primary forest has been converted to other uses or disturbed "brown down" in the dry season, said Huete.

Huete suggests the deep roots of trees in the undisturbed forest can reach water even in the dry season, allowing the trees to flourish during the sunnier,

“The finding that converted forests grow differently from undisturbed forests has implications for understanding fire regimes in the tropics, including the fires that sometimes rage in tropical areas during El Niño years, which bring drought to many tropical areas, including the Amazon.”

drier part of the year. In contrast, plants in areas that have been logged or converted to other uses cannot reach deep water in the dry season and therefore either go dormant or die.

Figuring out the metabolism of the Amazon rainforest, the largest old-growth rainforest on the planet, is crucial for understanding how rainforests and other tropical biomes function and how deforestation affects biodiversity and sustainable land use in the tropics. It will also help scientists better understand the global carbon cycle, which affects the natural sequestration and release of carbon dioxide, a major greenhouse gas.

The finding that converted forests grow differently from undisturbed forests has implications for understanding fire regimes in the tropics, including the fires that sometimes rage in tropical areas during El Niño years, which bring drought to many tropical areas, including the Amazon.

The research team figured out when the intact forest grows by analyzing five years of satellite images from the MODIS (Moderate Resolution Imaging Spectroradiometer) instrument mounted on NASA's Terra satellite and by cross-checking with information from local sites on the ground. The research was funded by NASA and is part of the Brazilian-led Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA).

Huete's collaborators included Kamel Didan, an assistant research scientist in the UA's department of soil, water and environmental science; Yosio E. Shimabukuro of the Instituto Nacional de Pesquisas Espaciais, São Jose de Campos, Brazil; Piyachat Ratana, a doctoral student in the UA's department of soil, water and environmental science; Scott Saleska, a UA assistant professor of ecology and evolutionary biology; Lucy R. Hutyra of Harvard University; Wenze Yang and Ranga Myneni of Boston University; and Ramakrishna R. Nemani of NASA Ames Research Center in Moffett Field, California.

The MODIS instrument began collecting data in 2000. Once a day, MODIS takes a picture of each spot on the Earth. Each pixel in the images represents a square of about 820 feet (250 meters) on a side. If it's too cloudy

at one spot one day, the next day's picture may be fine. Five years' worth of pictures means the scientists have at least one good image of every spot for every month of the year.

To be able to figure out when the Amazon rainforest is growing, Huete's lab used a new measure, called Enhanced Vegetation Index (EVI), for detecting greenness in MODIS images of very highly vegetated rainforests. Greenness is an indicator of active plant growth.

Plants are green because they contain the photosynthetic pigment chlorophyll. Growing plants generate more chlorophyll and therefore look greener.

The greenness can also be translated to a measure of plant growth called "gross primary productivity." Ecosystems with higher gross primary productivity take up and store more carbon in the form of carbon dioxide, a major greenhouse gas.

"We can look at this increase in greenness as a measure of Amazon health, because in the disturbed areas we don't see the greenness increase during the dry season," Huete said. "A lot of people are interested in the rainforest because of the humongous amount of carbon it stores. A very slight change in the forest's activity will make a tremendous change in the global carbon cycle."

Saleska and his colleagues and other research teams had conducted studies at local sites in the Amazon that suggested the intact rainforest grows more during the dry season. Those studies analyzed data from flux towers, which measure the seasonal gas exchange by vegetation. The new research confirms the local studies and indicates that the greener-in-the-dry-season pattern is basin-wide.

"With the satellite, we can say the whole Amazon basin is doing something," Huete said.

The team's next step, Huete said, is to see if other tropical rainforests behave the same way and how the rainforests behave in El Niño years. He added, "We also want to look harder at the transition zones at the edge of the rainforest to see whether different kinds of disturbance cause different growth patterns." ■

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# What Do Farmers Want?

## The Purpose of the Hopi Participatory Rural Assessment Project

By Joanne Littlefield



White and blue Hopi corn growing near Oraibi Wash on the Hopi reservation

Matt Livingston

Like many rural communities in Arizona, the Hopi reservation is dealing with people moving away to find better jobs. The traditions of the Hopi people on the reservation in northeastern Arizona have historically been tied to the land and to traditional crops.

Several years ago, Arizona Cooperative Extension's technical assistance and mentoring support with the Hopi tribe grew into the development of a Hopi-run nonprofit organization known as Hopi Pu'tavi (One Path) Project, Inc., which promotes learning, training and business opportunities for the Hopi people on the reservation—youth in particular. The intention is to provide options that will keep them close to home. The group sponsors activities on the reservation that will enhance Hopi culture and lifestyle.

The Village of Mishongnovi on the Hopi Reservation participated in the 4-H Foundation's Innovation Center program, "Charting Community Connections." In this program, youth in the village undertook a diagnostic study to determine ways to build the community.

Initially Pu'tavi members focused on enhancing the Hopi silversmith industry with activities that included training to increase hands-on silversmithing techniques, workshops on improving computer skills to market on the Internet, and the creation of affordable venues for sales of authentic Hopi arts. After hearing complaints over the years that reservation leaders put more money into ranching than into farming, the Hopi Department of Natural Resources decided the best way to find out what support the tribe could give to farmers was to ask.

With additional assistance from Iowa State University's

North Central Rural Development Center, and under the direction of the Hopi Department of Natural Resources, they focused on the future of their community through a survey of Hopi farmers with a \$35,000 Community Food Security Grant from USDA. Community representatives were recruited through the Hopi Pu'tavi Project and trained to interview farmers to find out what it would take to enable them to farm successfully.

Participatory rural assessment research projects are designed not only to gain community information, but to train area residents in interviewing techniques. Because they are a part of the community, these locally trained interviewers are often able to establish a comfort level with participants and therefore perhaps obtain more in-depth information than an outsider could. Not only did the interviewers get training on how to conduct interviews, they also helped develop the questionnaire and later presented their findings at community gatherings and before the tribal council. The community representatives said, as a result of their involvement in this project, they "gained a better understanding of Hopi farming and its needs."

"We wanted the Hopi to develop their own skills for doing this type of research," says Matt Livingston, an Extension Indian Reservation Program (EIRP) agent affiliated with the University of Arizona College of Agriculture and Life Sciences. "That way, when other projects come up down the road, these skills would be useful to them."

A questionnaire was developed that included specific questions on crops, seeds, planting dates, yields, water availability, equipment availability, farming techniques, soil conditions, crop rotations, farming by hand, garden-

ing, fruit trees, storage, uses for crops, land preparation, pest and weed control and irrigation. Community representatives established a sampling procedure to ensure that all villages and farming styles were included. They decided to conduct the interviews in Hopi whenever possible because pre-tests showed that for many Hopi farmers English does not adequately convey their ideas about agriculture.

In addition, farmers were asked who taught them how to farm and garden and when, how much longer they plan to farm and who will farm the land after they stop, obstacles they see to the continuation of farming in their households, and the kinds of actions they want to see regarding this tradition. Only 1.3 percent responded that they thought the solution lay in teaching children about growing, harvesting and using Hopi crops.

Additional questions asked:

- What do you see as some helpful future projects for Hopi farmers?;
- How much do you want to be involved in making changes?;
- Who do you see making these changes or doing these projects? The Tribe? The U.S. government?

About 43 percent responded that community (village-level) residents should get together and do something; 19.2 percent said they thought the tribe should do something; 7.7 percent thought it was their individual responsibility to find an alternative; 6.4 percent thought the tribe should make changes in conjunction with the U.S. federal government; and 2.6 percent expressed their belief that the tribe and village had a responsibility to provide answers.

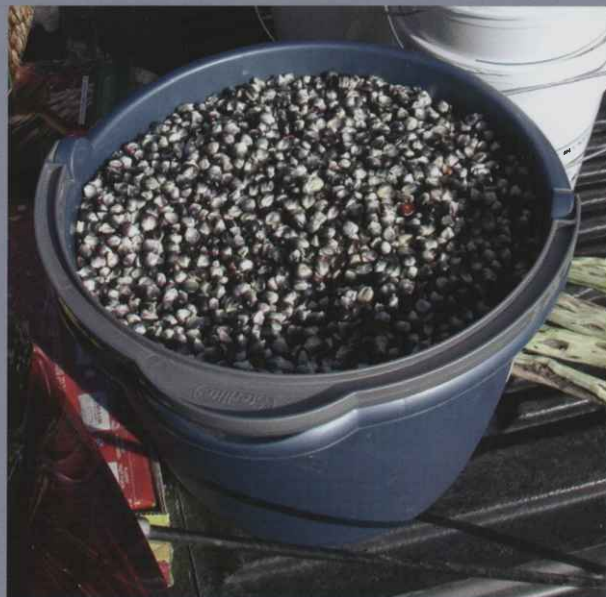
Farmers also mentioned that they wanted to see Hopi values taught (51.9 percent), and that farming should be taught (74 percent). Additionally, 26 out of 77 mentioned the establishment of a community farm.

In 2003 a report based on the questionnaire results was submitted to the USDA Community Food Program and the Hopi Tribe Department of Natural Resources: they learned that farming would continue. In 2004 the wider community was informed of the results through an Earth Day poster presentation.

"It's still very much attached to the culture and the culture is attached to it," Livingston says. Spiritually, it is extremely important for the Hopi people to be farmers. And according to the survey, when asked what they do to ensure a good crop, about 57 percent of the respondents said, "We pray" in some form or another.

Livingston brings his Peace Corps background to his work on the Hopi reservation through the motto, "You don't fish for someone, but rather teach them how to fish." Since 1991 he has worked side by side with the Hopi people, teaching the various agricultural techniques they wanted to learn so they could become more self-sustaining.

The arid climate and high altitude of the area means it's especially important for crops to be well-suited to the en-



Matt Livingston

Hopi blue corn seed. The sticks below it are traditional planting sticks.

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vironment. Dryland farming—relying on rainfall—is the norm. The village of Moenkopi is the only location on the 1,561,213-acre reservation using supplemental irrigation. Farmers across the reservation grow several different varieties of Hopi corn. Beans are the second-most dominant crop; squash, watermelon and other vegetable crops trail behind in acreage.

"Gardening essentially is more a woman's responsibility and field crops are more a man's responsibility here," Livingston says.

A new survey has been designed to ask single female heads of households about their needs for traditional Hopi foods.

"We hoped that women would participate in the initial survey, but the way it worked was that mainly men answered the questions," Livingston says, "which traditionally makes sense because farming is a man's activity. However, when the crops are delivered to the house it becomes the woman's responsibility and property." There is buying and trading of crops among the reservation villages, but commercial selling off the reservation really doesn't happen.

Besides job training for those who conducted the interviews, learning the importance of Hopi cultural traditions was another outcome of the project. Throughout the process, the interviewers, tribal council representatives and Hopi Pu'tavi members gained a sense of what is important to their community. While this doesn't guarantee that young people will stay on the reservation, or get involved in farming, it does allow for more precise future planning. ■

# “High Tech, High Touch” on Park Avenue

## The Norton School Expansion

By Susan McGinley

Forget Boardwalk or Park Place: the new McClelland Park building under construction at the corner of Park Avenue and Fourth Street will offer a unique business environment with a warm family atmosphere right here at the University of Arizona.

Accented with traditional brick, contemporary glass and other features that blend it into the “skyline” of the west end of the UA campus, the four-story McClelland Park complex will feature 70,000 square feet of high-tech auditoriums, classrooms, offices, lounges, outdoor plazas and other amenities, all custom-designed to provide a better fit for the John and Doris Norton School of Family and Consumer Sciences. It is scheduled for completion in June 2008.

Over the past decade the Norton School has grown so rapidly that its current home, an outdated, overcrowded 1958 building, feels like a shoe that’s too small. Office and research space is tight, and it lacks common areas where students and faculty can gather to share ideas. Newer, better designed facilities will enhance the quality of education received at the Norton School, attract more students, and assist in recruiting outstanding faculty members.

Part of the College of Agriculture and Life Sciences (CALs), the school is the modern descendant of the original home economics department. The first class in “domestic science” was offered in 1899, and the department was officially established in 1913. By 1950 enrollment was more than 200. Currently more than 800 majors and 200 minors are enrolled in the school.

“As the Norton School is evolving and expanding to meet the growing needs of the industry and society,” says Soyeon Shim, Norton School director, “the number of students pursuing degrees from the school, as well as the size of the faculty and the desired curriculum are expanding as well, outgrowing the current building.”

Shim, along with faculty and staff members, students and representatives from the school’s corporate partners met with architect Eddie Garcia of the Smith Group; Steve Grauer and others from Hensel Phelps construction firm; and Rodney Mackey’s team from UA Facilities Design and Construction to clarify what was needed. The result is a building that is professional yet personal, reflecting the Norton School’s dual emphasis on family issues and retailing.

In the new facility, wireless networking, videoconferencing and multimedia technology will enhance teaching, research and outreach. Students and faculty alike will find a place to share ideas, conduct research projects, and make professional contacts with representatives from the school’s numerous corporate and community partners. Returning alumni will rekindle long-held ties to their school in a more comfortable setting, while business collaborators will convene in a professional venue to bring the world of corporate ideas to the university and to recruit future graduates. The school will reflect the “high tech, high touch” concept advanced by John Naisbitt in his 1988 book *Megatrends*—the idea that high technology needs to be balanced with human involvement.

“Stepping in off the street, the lobby area will impart a neighborhood business-street feeling—corporate, yet friendly,” says Shim, who was involved throughout in the careful planning of the new building. “The entire first floor, including the outdoor Lakin Family Plaza, is a place where students, executives, alumni, family members and faculty can come together and interact, socially, professionally and academically.”



Smithgroup Inc.



A first on the UA campus, the Lakin Family Plaza is a tree-lined open atrium that symbolizes the importance of children and family to the Norton School and to society. It will form a perfect oasis for informal student gatherings, study groups, and play for visiting children using services or involved in research, according to Shim. It will also serve as an outdoor venue for events.

Along with academic advising offices and areas where students and faculty can convene and conduct research, the second floor features a multidisciplinary observation laboratory focusing on children and family interactions. Faculty members from across campus who have an interest in child and family research will use this space for collaborative research.

Faculty offices share the third floor with a unique Cooperative Extension suite where off-campus extension personnel can meet when they are visiting the campus from one of Arizona's 15 counties. With the new suite, family and consumer sciences Cooperative Extension and 4-H youth specialists will have a highly visible presence and permanent identity on campus for the first time.

"It's a workspace for agents to gather so they don't have to find a room when they're here," Shim notes. "It's always reserved for them."

The fourth-floor executive area includes administrative offices for executive programs, a multi-media board room, the Lundgren Center for Retailing, and the Take Charge America Institute.

Thanks to the success of an extensive, ongoing fundraising campaign called Cornerstones, the facility will be built entirely through private donations.

"This is a unique building," says Eugene Sander, vice provost and CALS dean. "Like the Marley Building, also part of the College, it is not funded by the taxpayers. Instead, it has been funded primarily by two agricultural industry giants, John and Doris Norton and Norman and Frances McClelland, along with a host of other significant donors." The Nortons and the McClellands pledged \$4 million each to support the expansion of the Norton School (*see sidebar*).

"The University will be like this in the future," adds Arizona Regent Fred Boice. "Persons of goodwill and forethought come together to create what the public sector can no longer create."

The name conveys so much more than just a building.

"'Park' is a very interesting word," says George Davis, UA provost. "It makes us think of openness, public accessibility, community, family, refreshment, recreation—restoration of the spirit and restoration physically. I think this park is about students, faculty, administrators, alumni and others coming together to work tirelessly in good spirit. This name, McClelland Park, is a name that is not only full of recreation, it's full of integrity."

Park Avenue, Tucson, will never be the same. ■



## A Legacy from the McClellands and the Nortons

McClelland Park was designed as a hub for innovative teaching, collaborative research and education, groundbreaking industry seminars and workshops, productive faculty and staff meetings, receptions, and alumni gatherings.

Named for Norman McClelland, chairman of Shamrock Foods Company and 1944 UA alumnus, and his late sister Frances, McClelland Park will house two academic programs—Family Studies and Human Development, and Retailing and Consumer Sciences—and three centers: the Terry J. Lundgren Center for Retailing, the Take Charge America Institute for Consumer Financial Education and Research, and the Institute for Children, Youth and Families.

"Frances and I talked about what we could do for the school," Norman McClelland remarked at the groundbreaking on May 9. "Our parents came to Arizona from Northern Ireland in 1912. In our dairy business we always stayed close to the university. This building reflects the intertwining of family and agriculture and is aimed at strengthening families, community and the marketplace."

John and Doris Norton are UA alumni and John is a third generation Arizonan and a founder of J.R. Norton Company. He served as deputy secretary of the United States Department of Agriculture during the Ronald Reagan administration.

"We're very excited for the students who will be learning in the new facility," the Nortons say. "The faculty of the school conducts cutting-edge research and provides an outstanding curriculum, addressing issues we believe are of critical importance to the future of our society."

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4-H'er Kellie Lamoreaux poses with leader Donna Wahl at the Pima County Fair.

## “Bunny Lady” is Self-Taught Expert

By Dale Quinn\*



\*reprinted with permission from the April 7, 2006 *Arizona Daily Star*

When East Side resident Donna J. Wahl moved to Tucson with her husband, Charlie, and two children 30 years ago, she never imagined she'd one day be referred to as the “Bunny Lady.” For more than 20 years, Wahl was a leader of Pima County’s 4-H rabbit group. She took on the role after her daughter received a rabbit as a gift for her fifth birthday. Her son also liked the animal and got one of his own. He joined 4-H, and a few years later Wahl was the leader of the rabbit group. When she started, she knew very little about rabbits.

“I learned right along with the kids, and I think that’s part of the fun of it,” she said. And learn she did. Now, Wahl has become an authority on rabbits.

She’s passed on the torch as leader of the rabbit group. But when people have questions about rabbit care, breeding or showmanship, they ask for Donna Wahl.

Julie Adamcin, who’s worked with Pima County 4-H Youth Development for more than 35 years, said Wahl and a handful of other leaders have achieved a “mother superior” status in the county.

“These are the people who have the character and diligence that if you do it, you do it right,” she said.

Wahl was a mentor for kids in the program, who in turn spread their

knowledge to younger kids, Adamcin said. She provided guidance to other adult leaders, who learned from the effective way she dealt with children.

“That’s the spark that holds kids in the program,” Adamcin said. “When the kid knows the volunteer cares about them as an individual, as a person.”

Now, Wahl has turned her love of animals and the Tucson area into art. Some of her work is on display at the Feminine Mystique Art Gallery in Tubac, about 45 miles south of Tucson.

Wahl paints colorful depictions of the desert around the Tucson area. She

## 4-H Memorial Scholarship Fund

Do you have a favorite 4-H leader who made an impact in your life? One longtime Pima County 4-H volunteer has established a memorial scholarship fund within the Arizona 4-H Youth Foundation to honor current and past volunteers. Contact Lee Duerringer at 520-626-5072 to see how you can honor your favorite volunteers.

Arizona Cooperative Extension



paints coyotes, birds and — of course — rabbits.

Wahl has been passionate about visual communication for a long time.

She attended the University of Wisconsin with a major in art. She had a career in print when she moved to Tucson. Her connections in the rabbit community led her to become the editor of Dwarf Digest Magazine, a quarterly newsletter focusing on a specific breed of rabbit.

Wahl began painting to provide gifts for her family and friends, but then a family member encouraged her to share her work with more people.

She never seriously considered showing her artwork in a gallery. But when she brought her portfolio to the Feminine Mystique Art Gallery, they agreed to display some of her pieces.

Adrienne Quinn, an artist and employee at the Feminine Mystique, said the gallery gives aspiring female artists a venue to display their work. She said Wahl's work has shown improvement in the year it's been displayed.

"She looks like a self-taught artist who puts a lot of effort into her work," Quinn said.

During her 4-H years, Wahl said she never considered herself a natural leader, though the rabbit program grew to consist of more than 50 members at one point under her leadership.

Sometimes her house teemed with kids, their parents and dozens of rabbits.

Adamcin said Wahl exhibits ideal leadership skills, though she might not realize it.

"You have leadership if people follow you," Adamcin said. At one time, her family had 140 rabbits living in the rabbitry beside their house. Her daughter was interested in genetics and studied the way the rabbits passed their traits from one generation to the next.

For a while, her home off Old Spanish Trail just south of Saguaro National Park East was like a "bunny Humane Society," Wahl said. If people wanted a rabbit, they came to her. They did the same if they wanted to give one up for adoption.

With the kids out of the house, she's got only nine rabbits hopping around the shed beside her home. For her, being a 4-H leader and raising rabbits was more than just an obsession with the fuzzy little creatures.

She took pleasure in spending time with her children and building connections with people in the community.

"I enjoy the animals," she said. "But it was basically a tool to help these kids build life skills."

She remembers a 9-year-old girl who came into her group too shy to emerge from behind mother's legs.

Later that same girl became a junior leader and helped other young rabbit raisers with their animals.

Now, if anybody has questions about how to "show" a rabbit in front of judges — how to emphasize its breeding strengths and downplay its weaknesses — they talk to the "Bunny Lady," Donna Wahl. ■

## Arizona 4-H Youth Development

While 4-H in Arizona had its beginnings in rural areas, it has grown to serve young people and volunteers from the major urban centers and suburban communities as well. Today's 4-H still has science and technology as its foundation. In addition, many projects are in personal growth and development and healthy lifestyle education. 4-H is helping young people become mature, competent adults capable of participation and leadership in their communities with valuable skills on entry into the workforce.

The University of Arizona is the land-grant institution of the state of Arizona. Its three-pronged mission of teaching, research and outreach includes 4-H Youth Development as the youth outreach component of Cooperative Extension, the major outreach component of the university.

[cals.arizona.edu/4-H](http://cals.arizona.edu/4-H)

## Call for Arizona 4-H Memorabilia

Special memories or memorabilia are being sought to be shared at the Arizona 4-H Museum at the UA's Maricopa Agricultural Center, part of the College of Agriculture and Life Sciences. For more information contact Vic Jimenez at 520-568-2273, [vjimenez@ag.arizona.edu](mailto:vjimenez@ag.arizona.edu).



S. Peder Cuneo

Shelter for homeless dogs in Belle Chasse, Louisiana.

# The Dogs and Cats of Belle Chasse

## A Veterinary Perspective on Disaster Preparedness

By Susan McGinley

When the residents of Belle Chasse, Louisiana were evacuated for Hurricane Katrina in September 2005, they were not allowed to bring any animals with them to Red Cross shelters. Thousands of people from the small, rural agricultural community in Plaquemine Parish, about 14 miles south of New Orleans, were dispersed to several other states.

Most of their dogs, cats, and other domestic animals went to a local shelter run by a veterinarian and his wife in an abandoned senior citizen center. The makeshift veterinary hospital held hundreds of dogs and cats; only a few were in cages. The stench, the noise and the chaos were overwhelming.

This is what Arizona Extension veterinarian Peder Cuneo encountered when he arrived in Belle Chasse on September 16, 2005. He had responded to a U.S. Department of Health and Human Services email request for health professionals to assist in Hurricane Katrina disaster relief. In addition to his veterinary license, Cuneo had worked as a firefighter during college, and completed the online FEMA Incident Command System program. After applying at a Tucson volunteer center on September 8, he was accepted within days and flew to New Orleans, where the Red Cross assigned him to assist with veterinary needs in Belle Chasse.

"The National Guard had rigged a tarp over the backstop of a basketball hoop in the yard," Cuneo remembers. "The dogs were outside and the cats were inside with a few ducks and a calf. There were hundreds of animals." A no-kill policy was in place, where any animals whose owners couldn't be found, or animals that couldn't be adopted, were sent to Minnesota instead.

A lot of households in Belle Chasse were poor; few of the animals in the shelter had been spayed or neutered and heartworm was prevalent. A high percentage of the dogs were pit bulls and pit bull crosses. The relief team actually had identified about a third of the animals' owners—some dropped their animals off on the way out of town; others who were allowed to return stopped by. Amazingly, a small group of local grade-school children from families who had just returned also served as volunteers, in addition to the veterinarian, his wife, a health care worker and Cuneo. They came daily to walk and water the dogs, and clean up after them.

And in this ravaged area, where nearly every building was heavily damaged or completely destroyed and utility crews were trying to repair downed power lines and clear debris off the roads, people would sometimes arrive out of the blue to help out with veterinary needs.

"Trucks would show up with leashes, dog and cat food, kennels and portable crates," Cuneo remarks. "Someone just drove down from Virginia with all of it." In spite of the help and supplies, there were still a lot of dogfights, he admits. "The really fractious dogs we put in air carrier crates. It was complete chaos inside—a lot of barking."

While he was in Belle Chasse—before Hurricane Rita struck—the shelter still had electricity and tap water the animals could drink, although it had to be boiled for human consumption. In spite of the crammed quarters, Cuneo says the place was still better off than most.

"Other facilities for stranded animals eventually covered several acres, so we were small-scale compared to that." One day the veterinary team went to St. Bernard Parish near New Orleans, where only 100 homes were habitable out of the original 45,000. "That day I saw an animal shelter with a roof but no sides, no electricity or running water, and fans run by generators," Cuneo says. "All the animals were in crates. It made our place look deluxe." The team helped load more animals into crates to be flown to California. Those actually were the lucky ones. Many of the dogs and cats in that parish were dead.

"The streets had a thick layer of mud that was filled with toxic pools of stuff from flooded warehouses," he says. "The animals drank that water."

Cuneo spent four days in Belle Chasse before Hurricane Rita hit and he was later reassigned to another area for two weeks to distribute water, ice, MREs and Pedialyte® to people in refugee centers. What he learned firsthand in Louisiana about human and animal evacuation applies to general homeowner precautions during disasters of any kind, including the summer fires that could threaten towns across the Southwest.

"Belle Chasse is located in a more agricultural, rural parish than New Orleans," Cuneo notes. "There was no looting, and there was an effective evacuation system where people who weren't ambulatory were assigned a caregiver. They didn't lose a lot of people in that parish and the town was just starting to open back up." The opposite was true in urban areas, where people who had high blood pressure and diabetes had terrible problems because they ran out of medications. Transportation was difficult because people couldn't get fuel and the traffic was impossible to navigate.

"People least able to take care of themselves got left behind," Cuneo explains. "When you have to evacuate, you need to have supplies to take with you." He now stocks his pantry better at home in Tucson, and suggests that home emergency plans should include preparations for any animals that are living in the household.

"Remember that Red Cross won't let you keep animals in a shelter for people. If you're evacuating in a rural area because of a fire, you must have a carrier for each animal, plus their food and any special needs items such as medications handy." Most counties have a shelter area designated for animals, and the Humane Society and Animal Control may be able to identify animals and link them with their owners if they are separated. People are encouraged to micro-chip their pets.

"What struck me about Belle Chasse was that a lot of people were just pretty determined to take care of themselves," Cuneo says. "The 'yoyo' principle hit me: no matter what, you're much better off assuming 'you're on your own.' If you can take care of yourself and your pets, regardless of whether you stay or go, you're leagues better off than if you wait for someone to help you." ■



S. Peder Cuneo

Calf and dog at Louisiana animal shelter.

## Emergency Precautions for Household Pets

Be prepared before disaster strikes. Have ready:

- Transport equipment, including pet crates, cages for pocket pets/reptiles, trailers for horses and other large animals
- Food and some drinking water for your animals, packed and ready to go
- A supply of medications and other special needs, ready to go
- Some type of identification for your animals: implanted microchips are recommended

Red Cross shelters will not accept animals but most counties have disaster plans to provide for temporary animal shelters. Contact your county emergency operations center to find out more about your county plan. For example, Pima County has a disaster response team that works with the county EOC, Pima Animal Control, the Humane Society and the Red Cross to provide for disaster-displaced animals

## Contact

S. Peder Cuneo  
520-621-2356, ext. 19  
cuneo@u.arizona.edu

# Historic Date Palm Links UA to Abu Ghraib, Iraq

By Elizabeth Davison



1955 palm planting ceremony in front of Old Main.

The trees in the University of Arizona Campus Arboretum link the world to Tucson. One fascinating tale of the tree collection is the linkage between Iraq and the UA campus.

In 1952, many UA students came from the dry lands of the world to study agriculture, geology, mining and other related subjects at the U.S. land-grant institutions that excelled in these disciplines. At that time the UA was collaborating with the U.S. Department of State and the USDA to assist in the development of the Agricultural College of Iraq at Abu Ghraib, near Baghdad. This was one of the first such collaborations between a U.S. university and a foreign government.

The UA field team “taught courses, improved curricula, prepared classroom demonstration materials and texts, assisted in training Iraqi faculty, initiated research and demonstration plots, organized field days and other extension activities, assisted in planning for facilities development and established a maintenance program and shop,” according to a report in *The University of Arizona College of Agriculture: A Century of Discovery*, published for the College of Agriculture and Life Sciences (CALs) centennial in 1985.

UA faculty served on the project in both Arizona and Iraq. Graduate degree programs in the United States were provided for two Iraqi faculty members and other Iraqi students completed courses the UA.

Phillip Eckert was dean of the College of Agriculture in 1952. He had responsibility for coordinating the project. To honor and thank him in 1955, Iraqi students planted a date palm from Iraq on campus. The tree still stands by Old Main, facing the UA Mall. From a small sprout with just a few leaves, it has grown to a robust multi-trunked tree nearly 20 feet tall. Dates regularly form on some of the older trunks.

Recently his daughters, Susan Eckert and Karen Sanzone, visited campus with Patricia and Hussam Urfali, wife and son of of Hufdhi Urfali, one of the original Iraqi students. They provided the above photo of the original installation in 1955.

The 50-year-old tree has an interpretive sign to honor Eckert and his efforts in establishing the Agricultural College of Iraq. ■

## A Fruitful Collaboration 1952-1959



Susan McGinley

Initiated in 1952, a cooperative project between the Agricultural College of Iraq and the University of Arizona’s College of Agriculture assisted in developing the Iraqi college into an efficient and effective instrument for improving agricultural methods and practices in Iraq. The Iraq Project was funded by the International Cooperation Administration, now the U.S. Agency for International Development. Taking inspiration from the American land-grant college agricultural curriculum, teaching, research and extension activities were included in a program that focused on soils, field crops, animal husbandry and farm machinery.

The program ended during the 1959-60 session when the original intent of establishing a four-year college of agriculture at Abu Ghraib was achieved. After seven years, the school had attained full college status, granting a Bachelor of Science degree, and enrollment had grown from 95 to nearly 300.

—Susan McGinley



# Climate Change in Arizona

## Workshop Educates Media

Workshop participants pictured from left to right, front row: Marley Shebala, Ted Morris, Mike Crimmins; second row, Tony Davis, Shoshana Mayden, Brad Branan; third row, Stephanie Doster, Greg Garfin, Emily Gersema; back row, Paul Giblin

**N**ine Arizona journalists gathered at the University of Arizona on February 15, 2006 for a full-day immersion into the science of climate change. The conference, titled “On the Trail of Climate Change,” was the first in a series of workshops for Arizona media sponsored by UA’s Climate Assessment for the Southwest (CLIMAS) project and Arizona Cooperative Extension.

“Global warming is becoming big news in Arizona, with drought, record temperatures, and devastating wildfires all capturing headlines,” said workshop organizer Shoshana Mayden, a UA graduate student in Geography. “Our goal is to give journalists the scientific background to cover these issues, as well as linking them to sources to draw on for stories.”

Participants included not only reporters in Tucson, but also journalists from Phoenix, Sierra Vista and the Navajo Nation. They were Marley Shebala, the *Navajo Times*; Ted Morris, *Sierra Vista Herald*; Tony Davis, *Arizona Daily Star*; Brad Branan and Renee Downing, *Tucson Citizen*; Emily Gersema and Paul Giblin, *East Valley Tribune*; and Connie Tuttle, *Tucson Weekly*. The journalists were given a primer on the climate of the Southwest by Mike Crimmins, an extension specialist in Soil, Water and Environmental Science. They later delved into the science behind global warming, learning from CLIMAS program manager Gregg Garfin about greenhouse gases, climate modeling, and climate change projections for Arizona. Both Crimmins and Garfin helped organize the workshop. Stephanie Doster, of the Institute for the Study of Planet Earth, also participated.

Water was a central topic, with Garfin’s presentation emphasizing that rising temperatures in the Southwest will lead to earlier snowmelt and increased evaporation in winters—both with implications for water supplies. A roundtable session gave participants a chance to ask questions about drought and water issues with three UA faculty: Bonnie Colby, Agricultural and Resource Economics; Kathy Jacobs, Arizona Water Institute; and Dave Meko, Laboratory of Tree-Ring Research.

Journalists got the opportunity to interact with scientific data through a number of hands-on activities. A web module demonstrated how climate change may already be increasing winter minimum temperatures at several locations around the state. A visit to the UA Laboratory for Tree-Ring Research showed participants how the varying annual bands of trees hold clues to the climate of the past. The day culminated with a demonstration of the online vegetation monitoring tool Arizona RangeView by extension agent Barron Orr and a team from the UA Office of Arid Lands Studies.

Feedback from participants was very positive, with all indicating the information provided will be useful for future stories. Mayden developed the workshop as part of the UA-NASA Space Grant Graduate Fellowship program. NOAA’s (National Oceanic and Atmospheric Association) Climate Program Office and Arizona Cooperative Extension provided additional funding. Materials from the meeting can be found at [www.ispe.arizona.edu/events/climate\\_trail/workshop1.html](http://www.ispe.arizona.edu/events/climate_trail/workshop1.html). ■

# UA Distinguished Outreach Award

## Tim Dennehy

By Joanne Littlefield

Throughout the late 1980s and early 1990s Arizona cotton growers suffered reduced harvests caused by infestations of whitefly, Lygus bug and pink bollworm. They turned to scientists at the University of Arizona and other institutions for help. College of Agriculture and Life Sciences entomologist Tim Dennehy led a team of researchers credited with helping to save the Arizona cotton industry. For his role, he received the 2005 UA Distinguished Outreach Award.

"He was very instrumental in identifying pest problems and directed us to other pest control strategies," says Rick Lavis, executive vice president for the Arizona Cotton Growers Association.

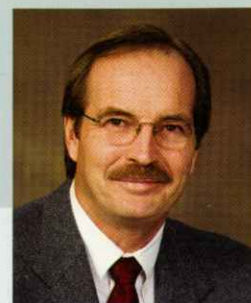
Established in 2003 by President Peter Likins, the annual award—sponsored by the UA executive vice president and provost—recognizes "outstanding faculty whose scholarship-based outreach to the state, nation and the world has demonstrated sustained excellence in the university's outreach mission." The award recognizes distinguished University outreach for the common good of the state and the nation and is the highest honor awarded in this category at the University of Arizona. The recipient's work must show evidence of an innovative outreach program within his/her discipline. Short- and long-term impacts and creative delivery methods are essential.

Nominators noted Dennehy's accomplishments in bringing discoveries from cutting-edge research into the field where growers could use them.

"I have worked, in various capacities, with the cotton industry and the University of Arizona College of Agriculture for more than thirty years," says Larry Antilla, director of the Arizona Cotton Research and Protection Council. "During that time, in my opinion, Dr. Dennehy has done more to provide vital technological support and guidance through research than any other individual."

"He can justifiably claim a major role in reducing the number of annual insecticide applications in Arizona cotton from over five when he came to less than two at present," says Robert Nichols, director of agricultural research for Cotton Incorporated.

Dennehy is perhaps best known for proactive, innovative programs for implementing genetically engineered crop plants and for reducing problems associated with pest resistance to insecticides. He established the UA Extension Arthropod Resistance Management Laboratory (EARML), the first facility of its type in the world. This facility has provided the infrastructure for outreach and research that helped to solve a crisis with whiteflies in Arizona and has helped to maintain the efficacy of Bt (transgenic) cotton against pink bollworm.



UA Biomedical Communications

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### Land-Grant Outreach

"Central to the University of Arizona's unique land-grant responsibility, outreach is a form of education that transcends the classroom and laboratory to bring knowledge to people outside of the University. Outreach is a manifestation of the University's teaching, scientific and scholarly research, creative activities and community service. It involves the generation, delivery, application and preservation of knowledge for the well-being of its external constituents."

- *University of Arizona's 2000 Self-Study Report to the North Central Association*

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Dennehy's scholarship activities include authorship of more than 170 scientific publications, including more than 100 since he arrived at UA in 1993. In addition to dozens of high impact extension publications, he has published many papers in prestigious scientific journals, including *Nature* and the *Proceedings of the National Academy of Sciences*.

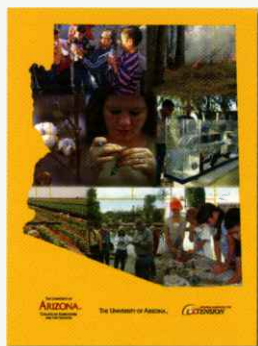
He has garnered millions of dollars to support his outreach programs from diverse sources, including the USDA, EPA, industry, and commodity groups. For example, he led a team project supported by a USDA grant for \$740,000 on "Sustainability of Bt Cotton in the Southwest." This project integrated problem-solving research and outreach, encompassing Arizona, California, and New Mexico.

Since arriving at UA, Dennehy has received numerous awards recognizing his sustained application of scholarship to achieve outstanding outreach, including the Arizona Agriculture 100 Council Faculty Member of the Year Award (1997), Arizona Farm Bureau Environmental Award (1998), Arizona Cotton Growers Association Industry Appreciation Award (1998), Cornell University's Griswold Lectureship (2001), and CALS Cooperative Extension Faculty of the Year Award (2002).

His efforts in building teams that include scientists, growers, regulators, and industry are viewed as a model for extension. He has been invited as a speaker and consultant throughout the world, including Australia, South America, Europe, and Asia.

Ian Denholm, (head of the Plant and Invertebrate Ecology Division, Integrated Approach to Crop Research, Rothamsted, England), wrote "The levels of coordination and cooperation achieved by Tim and his colleagues in Arizona represent one of the most exciting accomplishments with cotton pest management in any part of the world." ■

# Learn more about Arizona Cooperative Extension

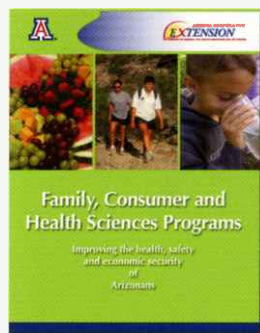


## Reaching Arizonans Statewide

The University of Arizona reaches citizens in every corner of the state through its three-fold land-grant mission of teaching, research and extension. The university and the College of Agriculture and Life Sciences are part of the nationwide land-grant

university system established in 1862 through the Morrill Act. Arizona Cooperative Extension is a statewide nonformal education network bringing research-based information into communities to help people improve their lives. This brochure highlights some of the diverse programs that bring the university to the people.

[cals.arizona.edu/extension/about/reaching\\_arizonans\\_statewide.pdf](http://cals.arizona.edu/extension/about/reaching_arizonans_statewide.pdf)



## Family, Consumer and Health Sciences Programs

Cooperative Extension outreach efforts in family, consumer and health sciences translate relevant University of Arizona research into effective practices people can put into immediate use in their homes and businesses.

This four-page brochure highlights Cooperative Extension programs in family, consumer and health sciences that improve the health, safety and economic security of Arizona individuals, families and communities. These programs are conducted by UA College of Agriculture and Life Sciences (CALS) extension agents based in counties statewide and by campus extension specialists from the Norton School of Family and Consumer Sciences and the Department of Nutritional Sciences.

[cals.arizona.edu/extension/fcs\\_publication.pdf](http://cals.arizona.edu/extension/fcs_publication.pdf)

## 4-H Youth Development

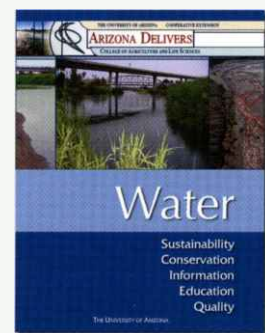


About 8,000 youth are enrolled members of 4-H clubs in Arizona.

Another 100,000 Arizona youth get involved in 4-H youth development through special educational opportunities at school, in after school programs, or at neighborhood or youth centers. These youth live in cities, suburbs, small towns and rural communities. The first 4-H club in Arizona was organized as the Boys Cotton Club in Chandler by George Peabody in 1913. Today 4-H youth development in Arizona is a compilation of educational programs for urban and rural youth, providing opportunities for leadership and skills development. This 16-page booklet provides a closer look at Arizona 4-H Youth Development in the 21st century.

[cals.arizona.edu/4-h/pdf/new\\_booklet.pdf](http://cals.arizona.edu/4-h/pdf/new_booklet.pdf)

## Water—Sustainability, Conservation, Information, Education and Quality



Issues surrounding drought, water supply, water quality and conservation affect Arizona residents from all walks of life. Recent climatic fluctuations plunged already arid regions of the West into a prolonged drought.

Programs from Arizona Cooperative Extension are the key to delivering expertise and information to residents throughout the state. This brochure highlights research and extension from the College of Agriculture and Life Sciences; these programs help ensure a sustainable, high-quality water supply for economic development and enhanced quality of life for all of Arizona.

[cals.arizona.edu/extension/water\\_publication.pdf](http://cals.arizona.edu/extension/water_publication.pdf)



College of Agriculture and Life Sciences



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