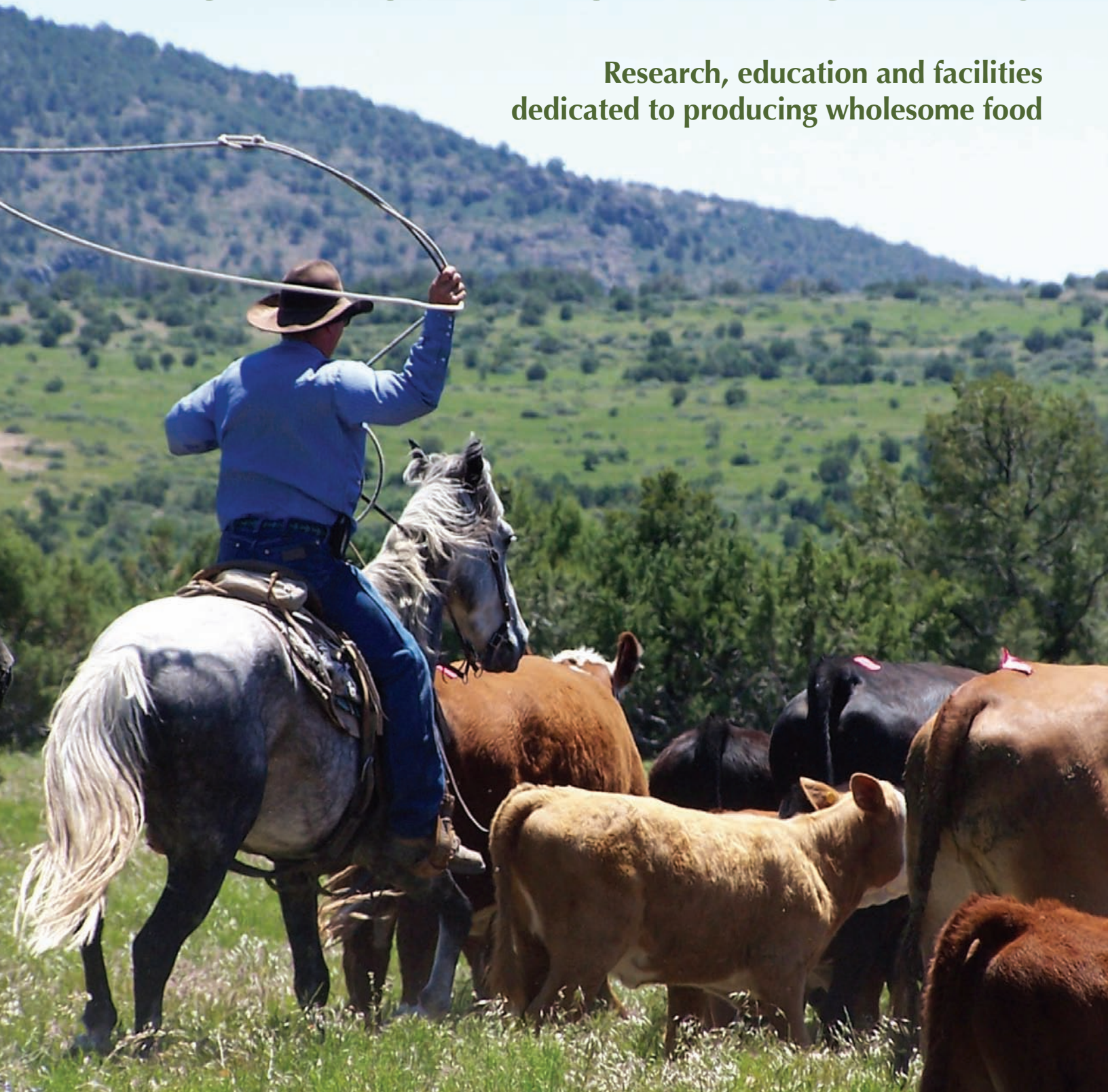


BEEF CATTLE ON ARIZONA RANGELANDS

Research, education and facilities
dedicated to producing wholesome food



Ranchers who want to stay in business are dedicated to wise stewardship practices. Livestock producers depend on the health of the land and of the animals they produce. Sustainable ranching requires effective yearly and seasonally-adapted management by ranchers. Each rancher, usually in conjunction with one or more public land agencies, must figure out what works on their ranch. University of Arizona Cooperative Extension and the College of Agriculture and Life Sciences assist ranchers and range managers through applied research projects, workshops and demonstrations at agricultural research centers and on cooperator ranches.

According to a recent survey, Cooperative Extension enjoys a high degree of credibility among both land use agencies and ranchers and is viewed as objective and unbiased most of the time. Extension clientele stressed the need for continued and expanded technical assistance and educational programs. It also emphasized the need for Extension, ranchers and land management agencies to work together to develop management plans that ensure grazing permit renewals in viable areas. Our shared goal is to have viable ranching and sustainable and diverse rangelands.



The range monitoring program has been active since 1978, providing hands-on training to hundreds of ranchers and natural resource agency personnel. UA faculty work with ranches to develop site-specific range monitoring protocols, including use of historical data, local weather patterns and rangeland conditions. Well-executed grazing systems may result in a reserve of forage (vegetation) which can mediate the effects of drought, maintain a high quality diet through much of the grazing year (with less need for expensive supplemental feeds) and provide for less variation in livestock production from dry to wet years.

One method used to study the condition and availability of range plants is to pace along predetermined lines and measure vegetation at regular intervals. Along these transects researchers take note of the different plant species, and the percentages of each; they also describe soil conditions. Thus, monitoring plants, as well as soils, helps determine if grazing animals have an effect on the environment.

Ranchers and land management personnel are learning through educational workshops such as “Range 101: Arizona Guide to Range Management and Analysis”, planned jointly with the Arizona Cattle Growers’ Association and various land management agencies. The workshops present topics such as rangeland ecology, soils, animal nutrition and policy issues. The result is that each range manager, in cooperation with any agency personnel, can develop an individual plan and adjust it on an ongoing basis.

Understanding how grazing animals are distributed across the range is one of the most challenging aspects of the rangeland management profession. As grazing animals forage across landscapes, they influence the environment through the plant species they eat and the habitats they occupy. The Animal Foraging Behavior and Distribution Program examines how both wild and domestic animals affect the environment and suggests potential management solutions.



Monitoring rangelands

Rangelands are lands which, because of physical limitations such as topography, relatively low rainfall and soil type, are generally unsuited for cultivation but which may provide forage for grazing animals. Many rangeland plants have evolved and adapted to tolerate some level of grazing by some animal species. Range monitoring looks at plant and animal interactions and productivity rather than plants or animals in isolation.

Animal health and food quality

Consumers want to know about their food, specifically how the beef industry uses antibiotics. For the past 16 years CALS faculty have been offering training to producers—through the Arizona Beef Quality Assurance Program—in proper product storage, record keeping and animal injection sites. The emphasis is on the production of a safe, wholesome product free from blemishes, which meets or exceeds quality standards that consumers expect.



The Arizona Youth Livestock Quality Assurance and Food Safety Program teaches youth producers good management practices in the handling and use of animal health products. Through the 4-H Youth Development program, livestock exhibitors attend a three hour certification workshop and are re-certified every three years. In order to be re-certified youth may attend another certification workshop or complete a checklist verifying the implementation of the good production practices. When youth complete this program, they demonstrate their commitment to “quality assured” meat production.



Trace nutrients—including selenium, copper and zinc—are required for healthy cattle. Research from the 1960s showed that a large area of central Arizona was deficient in selenium. Recent sampling revealed that most of the areas along the Mogollon Rim in north central Arizona were not only selenium deficient, but also copper deficient at times. When selenium, copper and zinc are at low levels in Arizona’s soils, the plants that grow there are lacking in them as well. CALS scientists have learned not only how cattle health is affected when their diet lacks these critical minerals, but also investigated a more efficient way to get cattle to consume them. Ranchers traditionally added minerals to salt blocks placed across the range to compensate for this deficiency. The rugged terrain over much of the rangeland, along with high fuel costs, can make getting the minerals to the animals difficult.

Instead of making the cows walk to the needed minerals, scientists gave them two doses in bolus (pill) form of a trace mineral mix and monitored their progress over the next three years. The findings showed that the bolus was effective in raising cow liver copper and blood selenium and that it also raised blood selenium in the calves. The next step is to determine whether this treatment is economically feasible for ranchers to adopt.

Communicating about animal health issues

The Arizona Livestock Incident Response Team (ALIRT) is a partnership between the UA Veterinary Diagnostic Lab, the State Veterinarian’s Office and the Arizona Cattle Growers’ Association. It uses a network of veterinarians, livestock specialists, University of Arizona Cooperative Extension, and Arizona Department of Agriculture livestock officers as early responders for large animal health issues. CALS faculty provide technical training as well as the general educational programs. One goal of the group is to minimize response time during an animal health crisis by emphasizing timely, proper sample collections and enhanced communications between the producer and the response team. While ALIRT was formed, in part, in response to an increased concern about bioterrorism, the team responds to other disease outbreaks and plant poisonings when multiple animals are involved.

The Arizona Veterinary Diagnostic Laboratory (AzVDL) includes bacteriology, virology, toxicology and pathology laboratories as well as necropsy rooms for small and large animals. It provides services to veterinarians, animal owners and federal and state agencies for the diagnosis of disease problems of livestock, companion animals, zoo and wild species. The AzVDL works with a statewide bioterrorism program where state and federal officials, the state veterinarian, UA veterinary science and animal sciences faculty and other veterinarians cooperate in reporting anything that could be a foreign or exotic disease.

Sustaining ranch profitability

Beef cattle production is the top agricultural product in the state, ranked by market value at the gate. As of January 1, 2006, there were 940,000 cattle and calves in the state, with an average herd size of 200 head. Cattle ranching in Arizona is dependent on the use of public and private rangelands for grazing; these lands make up approximately 86% of the 72.7 million acres of Arizona. Only 16% of Arizona land is privately owned; Indian Reservations account for another 28%. Of the remainder 13% are state trust lands managed by the Arizona State Land Department—the remaining 43% are considered public lands administered by agencies of the federal government.

Many cow-calf producers were finding that they were getting less money for the animals they sold, due, in part, to pressure from foreign markets and dwindling forage. Many Arizona cow-calf producers did not feed their calves to market size, nor did they retain ownership. As a result, they lacked production information to show buyers in order to ask for better compensation. They wanted to know how their cattle compared with national standards, so they could make any needed changes in their herds the next year.

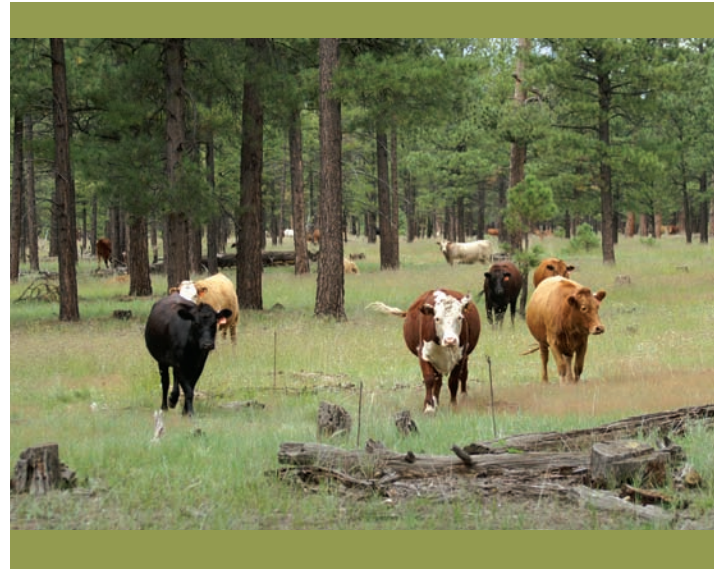
The Arizona Ranch to Rail program, which started in 1997 and had its final group in 2006, has provided answers in the form of data collected at the feedlot and through harvest. Producers sent between 5 and 20 calves to Benedict Feedlot in central Arizona where feed and vaccinations were monitored. Once harvested, data were collected on quality characteristics such as marbling and muscling. Armed with this information, producers were better able to make changes in their production systems. For example, because many of the animal deficits are directly tied back to genetics, changes in bull selection might be needed.



Fertility is one of the most important factors in the economic success of a livestock enterprise. A new test determining bull fertility has been developed through collaborative University of Arizona and industry research. The test is not only accurate; it's also user-friendly, faster than the previous two-day laboratory method and cost effective.

Housed in a small plastic cassette about the size of a stick of chewing gum, it has a three-year shelf life, requires no special storage, and can be used while doing routine examinations at the holding chute. Once the specimen is obtained, it takes 20 minutes or less to run. It works just like a pregnancy test that can be conducted at home: a purple line in the cassette window indicates the presence of the fertility associated antigen (FAA). The test is meant to be included along with the traditional breeding soundness exam (BSE) conducted on bulls.





Agricultural Experiment Stations provide research and demonstrations

Applied research and education projects—on cooperated ranches and at agricultural research centers—are crucial to developing pertinent information for land use managers. The University of Arizona has two centers dedicated to addressing environmental, wildlife and domestic livestock issues applicable to Arizona and the Southwest.

Along the Mogollon Rim, the V Bar V ranch is a 57-pasture grazing allotment, running about 30 miles east from Camp Verde and varies between four and five miles in width. Slightly more than forty acres is private land, with the remainder held under lease from the U.S. Forest Service.

In addition to 550 cattle, the ranch is also home for a wide variety of wildlife. Vegetation zones, including high desert chaparral, pinyon-juniper woodland, and pine forest, are typical of those on most of the commercial ranches in central and northern Arizona.

Because the V Bar V is a fully operating, working ranch, research performed there involves an applied approach to problem solving. Faculty and students staff the ranch and conduct research in animal and plant science, veterinary science, renewable natural resources, agricultural economics, soil and water science, and agricultural engineering.

Each year, in order to share information with the wider community, on the last Saturday of August the general public is invited to the ranch for hands-on learning opportunities about ranch and range environments at the V Bar V.

The Santa Rita Experimental Range (SRER) is located 40 miles south of Tucson. Established in 1902, it is the oldest experimental range in the country. SRER includes more than 80 square miles—spanning the Sonoran Desert at less than 3,000 feet elevation and receiving less than 10 inches of annual precipitation—to semi-arid grassland scrub at 4,500 feet elevation and receiving about 18 inches of annual precipitation. Contiguous to SRER is a wilderness area in the Santa Rita National Forest which makes

up a total gradient of protected land from less than 3,000 to over 9,000 feet elevation.

SRER was founded to study range recovery from drought and overgrazing, as well as sustainable grazing practices. Livestock grazing has been studied by university and government scientists at SRER for over 100 years. Parts of the rangeland have been excluded from grazing since 1903 and many ecological and wildlife studies have been conducted on grazed and ungrazed areas at SRER. One unique scientific resource for this experiment station is an archive of repeat photos, taken periodically at the same location, some as old as 1902. An updated approach to rangeland monitoring, an adaptive management grazing plan, was started on the SRER in late 2006.



New tools for ranchers and land management agencies

The geospatial tool kit for field mapping (www.geospatialextension.org/Resources/Cool_Tool/The_Geospatial_Tool_Kit/) provides managers with a simple, inexpensive, digital way to collect and map field data. This tool kit brings imagery, GPS and GIS together into one turn-key, field-based, decision support solution with multiple applications.

RangeView (rangeview.arizona.edu) provides managers with powerful, simple to use applications for viewing, animating and analyzing satellite imagery in order to monitor vegetation dynamics through time and across landscapes.

Rangelands West (rangelandswest.org/) provides access to research, practical tools, overviews of policy issues and educational information on rangelands of the western U.S. The Web site includes online access to the Journal of Range Management (now called Rangeland Ecology & Management) and an interactive geospatial interface to Natural Resources Conservation Service Ecological Site Guides.

Department of Animal Sciences
(520) 621-7623
animal.cals.arizona.edu/

School of Natural Resources
(520) 621-7255
ag.arizona.edu/srnrr/

Arizona Veterinary Diagnostic Lab
(520) 621-2356
microvet.arizona.edu/AzVDL/index.shtml

Arizona Cooperative Extension
(520) 621-7205
cals.arizona.edu/extension

Agricultural Experiment Station
(520) 621-7201
cals.arizona.edu/aes/

County Extension offices

Apache
(928) 337-2267

Cochise
(520) 384-3594

Coconino
(928) 774-1868

Gila
(928) 474-4160

Graham
(928) 428-2611

Greenlee
(928) 359-2261

La Paz
(928) 669-9843

Maricopa
(602) 470-8086

Mohave
(928) 753-3788

Navajo
(928) 524-6271

Pima
(520) 626-5161

Pinal
(520) 836-5221

Santa Cruz
(520) 281-2994

Yavapai
(928) 445-6590

Yuma
(928) 726-3904

Indian Reservation offices

Colorado River Indian Tribes
(928) 669-9843

Hopi
(928) 734-3708

Hualapai
(928) 769-1284

Navajo Nation
• Shiprock
(505) 368-1028

• Window Rock
(928) 871-7406

San Carlos Apache
(928) 475-2350

March 2007



Produced by ECAT (Educational Communications and Technologies)

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, James A. Christenson, Director, Cooperative Extension, College of Agriculture & Life Sciences, The University of Arizona.

The University of Arizona is an equal opportunity, affirmative action institution. The University does not discriminate on the basis of race, color, religion, sex, national origin, age, disability, veteran status, or sexual orientation in its programs and activities.

