Arizona Range and Livestock News
ARIZONA COOPERATIVE EXTENSION

February 2022

Plant of the Month:

Soapberry

Sapindus saponaria

Soapberry is generally a small tree, but can attain heights up to 20 feet tall. It occurs at elevations between 2,500 and 5,000 feet in central and southern Arizona, down into South America. The leaves are pinnate with numerous lanceolate leaves. The flowers occur in broad, many flowered panicles with small whitish flowers. Fruits are amber colored with translucent pulp. The roots contain buds that can develop into new trees. Soapberries are most often found in small clusters containing numerous trees that share the same root system.

The fruits often hang on the trees long after ripening. These have been used in the southwestern United States and in Mexico for washing clothes. They are poisonous, containing a high percentage of saponin, and cause dermatitis in some people.

Monitoring Minute:

Measuring Density

Density describes the number of individual plants in a given area. The term refers to the closeness of individuals. In situations where identification of individuals is unclear, density measurements may be based on some other counting unit, such as culms or shoots for sod-forming grasses or the basal stems for shrubs.

Figure 1: Measuring the density of mesquite (number of trees/acre) before and after herbicide or mechanical treatment is useful in evaluating the success of rangeland management practices.

Density may provide useful inventory information for large perennial species, particularly trees and shrubs. However, density is rarely measured in monitoring situations because it can be very time consuming, and there are errors associated with the identification of individual plants. Application of counting individuals is limited by the types of plants (grasses, forbs, shrubs, trees) and their spacing.
Density is an attribute that is tedious to measure but easy to interpret. It is most often applied to larger plants, such as trees, shrubs, and more prominent perennial forbs. Density is often used as a baseline inventory of the structure of rangeland or forest vegetation, by quantifying different species or various ages within a single species. Density data is also gathered to monitor the effect of various land use treatments, such as plant survival following burning or herbicide application, particularly for woody species.

The following should be considered when using density.

1. Units to express density should be selected so that actual plant numbers are easy to visualize. For example, it is more meaningful to express an infrequently occurring shrub as 50 shrubs/ha rather than 0.005 shrubs/m2, whereas 15 seedlings/m2 is easier to imagine than 150,000 seedlings/ha for the density of an abundant annual grass. Density measurements are sometimes unsuitable for the herbaceous layer, especially when there are numerous plants to count, or identification of individuals is difficult. Nonetheless, density is regularly used to evaluate seedling emergence and survival in a rangeland reseeding program. Density is also commonly described in autecological (ecology dealing with individual organisms) studies, that trace the demography of herbaceous or woody populations.
2. Species composition can be determined from density data, by calculating the contribution of each species to the total plant count of the sample. However, the relative density of species of differing sizes provides little information about their actual biomass, ecological dominance, or community function.
3. Density can provide useful indicators in an inventory and monitoring program to determine range condition and range trend because it remains relatively stable from year to year, regardless of changes in biomass that result from rainfall fluctuations or short-term grazing patterns.
4. Some critical issues to be considered when designing sampling protocols to determine density include boundary decisions, identification of individuals, influence of spatial patterns, rooted or canopy dimensions, and species groups.

From: *Guidelines for Monitoring Arizona Rangelands*; George B. Ruyle, Kim H. McReynolds, Larry D. Howery and Mitchel P. McClaran.

ALIRT Team Bulletins

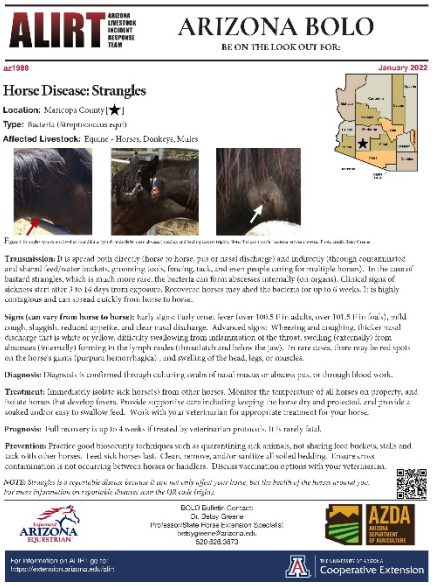
The following ALIRT Team Bulletins were recently published:

Horse Disease: West Nile Virus (Issued January 2022)
https://extension.arizona.edu/pubs/horse-disease-west-nile-virus

Horse Disease: Equine Infectious Anemia (EIA) (Issued January 2022)
https://extension.arizona.edu/pubs/horse-disease-equine-infectious-anemia-eia

Horse Disease: Strangles (Issued February 2022)
https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1988-2022.pdf

For more information on ALIRT go to: https://extension.arizona.edu/alirt


ALIRT ARIZONA LIVESTOCK INCIDENT RESPONSE TEAM

ARIZONA BOLO

BE ON THE LOOK OUT FOR:

az1988 January 2022

Horse Disease: Strangles

Location: Maricopa County(★)

Type: Bacteria (Streptococcus equi)

Affected Livestock: Equine - Horses, Donkeys, Mules

Transmission: It is spread both directly (horse to horse, pus or nasal discharge) and indirectly (through contaminated and shared feed/water buckets, grooming tools, fencing, tack, and even people caring for multiple horses). In the case of bastard strangles, which is much more rare, the bacteria can form abscesses internally (on organs). Clinical signs of sickness start after 3 to 14 days from exposure. Recovered horses may shed the bacteria for up to 6 weeks. It is highly contagious and can spread quickly from horse to horse.

Signs (can vary from horse to horse): Early signs: Early onset, fever (over 100.5 F in adults, over 101.5 F in foals), mild cough, sluggish, reduced appetite, and clear nasal discharge. Advanced signs: Wheezing and coughing, thicker nasal discharge (can be white or yellow, difficulty swallowing from inflammation of the throat, swelling (externally) from abscesses (internally) forming in the lymph nodes (beneath jaw and below the jaw). In rare cases, there may be red spots on the horse's gums (purpura hemorrhagica) , and swelling of the head, legs, or muscles.

Diagnosis: Diagnosis is confirmed through culturing swabs of nasal mucus or abscess pus, or through blood work.

Treatment: Immediately isolate sick horse(s) from other horses. Monitor the temperature of all horses on property, and isolate horses that develop fevers. Provide supportive care including keeping the horse dry and protected, and provide a soaked and/or easy to swallow feed. Work with your veterinarian for appropriate treatment for your horse.

Prognosis: Full recovery is up to 4 weeks if treated by veterinarian protocols. It is rarely fatal.

Prevention: Practice good biosecurity techniques such as quarantining sick animals, not sharing feed buckets, stalls and tack with other horses. Feed sick horses last. Clean, remove, and/or sanitize all soiled bedding. Ensure cross contamination is not occurring between horses or handlers. Discuss vaccination options with your veterinarian.

NOTE: Strangles is a reportable disease because it can not only affect your horse, but the health of the horses around you. For more information on reportable diseases scan the QR code (right).

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For information on ALIRT, go to:
https://extension.arizona.edu/alirt

Cooperative Extension

What can the Arizona Beef Quality Assurance class do for Arizona Producers?

Nate Brawley, Assistant in Extension: Livestock Production - Graham & Greenlee Counties

Consumers care more now more than ever where their food comes from. Therefore, producers need to take measures in their operation to give consumers a great experience when purchasing and eating beef. BQA helps producers accomplish both. BQA principles help Arizona ranchers raise the quality of beef they produce while instilling consumer confidence in the beef they buy to feed their families.

Beef Quality Assurance is a certification class offered through the University of Arizona Cooperative Extension Office. The local county agents put on multiple classes throughout the year to allow producers to become certified. Becoming certified helps producers in multiple ways to better their operations and become more successful.

BQA is a 3-hour course taught by certified Extension personnel that is good for 3 years. Following the 3 years certification, producers are required to attend 4 hours of continuing education credits to continue to be certified. These credits can be obtained by attending other livestock events put on by UA Cooperative Extension.

Beef Quality Assurance uses science, research, and education to identify practices producers can implement into their operation to become better livestock producers. Using BQA Audits, the industry learns where producers can improve to cut cost and be more profitable. For example, in the 2000 audit, producers were losing $11.47/head (Fig. 1) because of poor animal management.

Beef Quality Audit Findings

Management Factors BQA Can Influence

Hide defects	$1.70/head
Injection-site lesions	3.59/head
Dark cutters	5.43/head
Bruises	.75/head
TOTAL	$11.47/head

(Source National Beef Quality Audit, 2000)

Figure 1

BQA focuses on best industry practices including good animal husbandry, vaccination protocols and procedures, record keeping, establishing a biosecurity program, and more. These industry practices help instill trust in consumers while combating misinformation learned from social media and other poor sources outside the industry.

Beef Quality Assurance can also be a value-added marketing strategy when you sell your calves. Tyson and Cargill are just two of the big processing facilities that choose not to buy cattle from operations that are not BQA certified. They recognize the value of catering to the consumer and giving them a product that is produced by ranchers that certify their operation is operating in a way that is best for the animal.

Adding BQA certification is something that every Arizona producer ought to consider. Utilizing the BQA principles in your operation is one of the few things that you can do that adds value to your operation while not costing you anything. Things like low stress handling, record keeping, and proper vaccination procedures help you maximize efforts put into your operation. Contact your local Extension Office about the next BQA class dates.

Nitrate Toxicity

Ashley Wright, Livestock Area Agent, University of Arizona Cooperative Extension

There are several plant species in Arizona known to accumulate high levels of nitrate under stressed conditions (i.e. drought). These species include Johnsongrass, Pigweed, Kochia, Russian Thistle, Lambsquarters, and some crop species such as sudangrass. Alfalfa can even accumulate nitrate under the right conditions. Plants naturally uptake nitrogen from the soil and utilize it during photosynthesis. Anything that disrupts that normal cycle puts plants at risk for accumulating high levels of nitrate. Young, growing plants are most likely to accumulate nitrates, especially if subjected to a stress event such as a late frost. Plants that survive a drought scenario are likely to accumulate and retain high levels of nitrates, especially several days following the first rain events after drought.

When consumed by cattle, nitrates (NO_3) are converted to toxic nitrites (NO_2) in the rumen. These nitrites are absorbed into the bloodstream where they bind hemoglobin (the compound in the blood that binds and carries oxygen), turning it into methemoglobin. As a result, cattle are unable to get adequate oxygen to their tissues or organs and suffocate. Common signs of nitrate toxicity include blue or chocolate tinged membranes, excessive salivation, urination, and difficulty breathing as well as the characteristic chocolate colored blood. As the poisoning progresses, cattle become weak. Moving cattle around may exacerbate symptoms or cause death: movement of muscle requires oxygen. Pregnant cattle may abort even at low, non-lethal doses of nitrate. Poisoning from nitrate can happen very quickly, often cattle are simply found dead. Horses, as hind gut fermenters rather than ruminants, are less susceptible than cattle to nitrate toxicity. If cattle are found early, they may be treated with methylene blue. Post-mortem diagnosis can be made through testing the ocular fluid in the eye of a deceased animal. Plants or forage suspected of being high in nitrate can be tested, as can water sources. Labs may report nitrate levels in different ways, as nitrate (NO_3), nitrate-nitrogen (NO_3-N), or potassium nitrate (KNO_3). Be sure to look at the correct recommendation of safe levels for your lab's reporting method.

Interpretation of Laboratory Results

Form of Nitrate Reported			Recommendations for Feeding
KNO_3	NO_3-N	NO3	
0 - 1% 0-10,000ppm	0 - 0.15% 0-1500ppm	0 - 0.65% 0-6500ppm	Generally considered safe for livestock.
1 - 1.6% 10,400-16000 ppm	0.15 - 0.23% 1495-2300 ppm	0.65 - 1% 6500-10,000 ppm	Caution: Potentially toxic at this level. Mix, dilute, limit feed forages at this level.
>1.6% >16,000 ppm	>0.23% >2300 ppm	>1% >10,000 ppm	DANGER, DO NOT FEED: Potential for toxicity high.

The best way to prevent toxicity is to monitor pasture conditions closely. Test purchased hay or forage products that are suspected to be high in nitrates and dilute with low nitrate forages if necessary. If possible, move cattle or provide supplemental feeding if the only plants greening in up a pasture are nitrate accumulators, especially following a season of drought or when a late spring frost is expected. Don't overgraze pastures: cattle are more likely to overconsume nitrate accumulating forages when overstocked.

Further Reading:

Forage Facts: Nitrate Toxicity
https://www.asi.k-state.edu/doc/forage/fora13.pdf

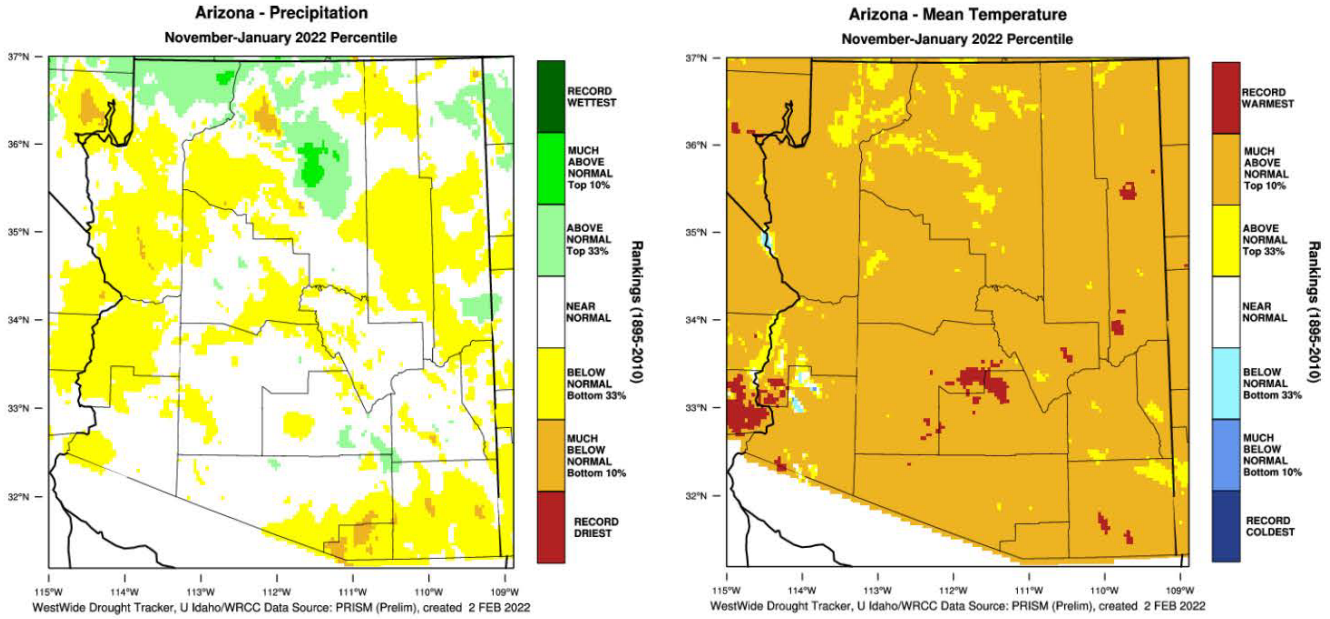
Nitrate Toxicity
http://www.iowabeefcenter.org/information/IBC50.pdf

Beware of Nitrate Poisoning in Livestock
https://www.ag.ndsu.edu/drought/livestock-poisoning/beware-of-nitrate-poisoning-in-livestock

Arizona Seasonal Climate Summary: Winter 2021-22

February 2, 2022 - The past three months have been a mixed bag of winter weather for Arizona from very dry and warm to cool and wet. The warm and dry fall conditions that set up across the Southwest in October carried through into November. Very few areas observed any appreciable precipitation in November and temperatures were much above-normal for the month across Arizona. Fortunately, the weather pattern changed in December as the winter storm track shifted south helping to steer several storm systems into the region throughout the month. This was especially true towards the end of the month when a series of cold and wet storm systems brought widespread precipitation (including upper elevation snow) to much of the state. Overall, most of Arizona observed above-average precipitation in December (except for the far southeast corner) while temperatures were above-average due to a couple of short warm spells at the beginning and end of the month.

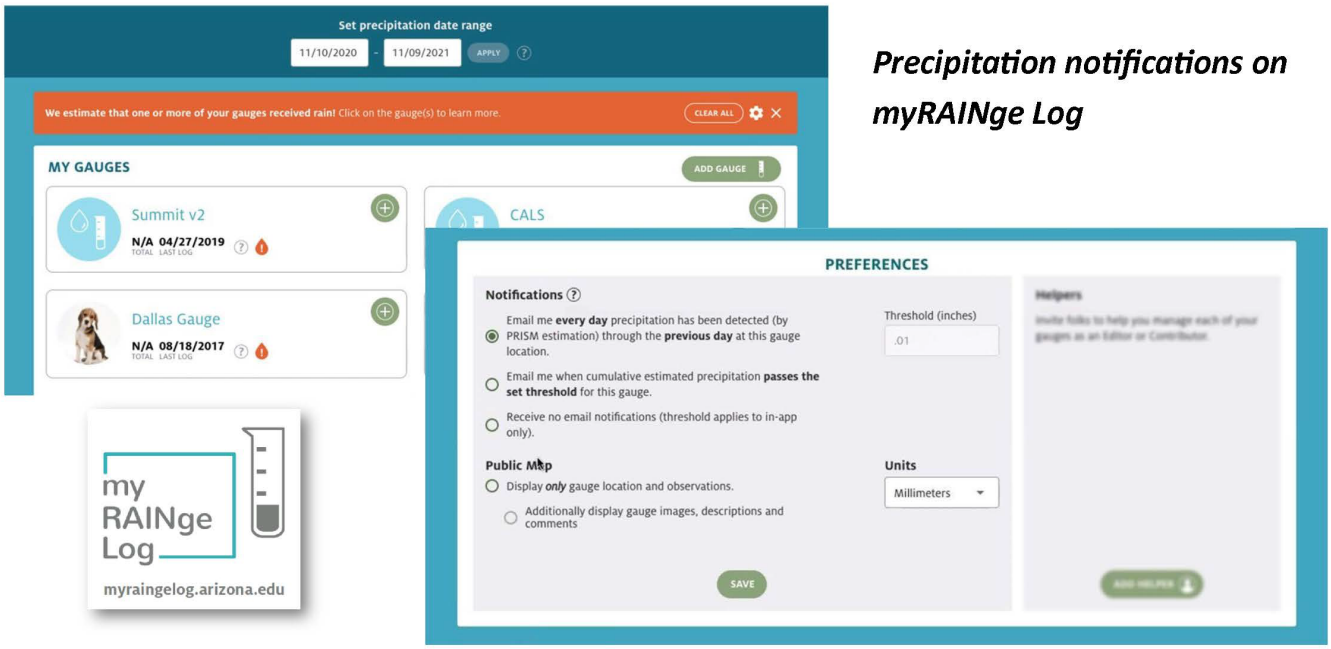
The dry weather pattern returned in January thanks to a robust La Niña event in the Pacific Ocean with much of the state observing, again, below-average precipitation. Overall, November through January precipitation totals were near to slightly below-average with almost all of the precipitation in this three month period coming in December. Temperatures were solidly above-average over this period due to warm spells occurring in all of the months. Short-term drought conditions, as reflected in recent U.S. Drought Monitor updates, have had a tough time of improving with the unevenness of the precipitation through the period and persistent above-average temperatures.



November-January precipitation and temperature rankings from the WestWide Drought Tracker

(http://www.wrcc.dri.edu/wwdt/)

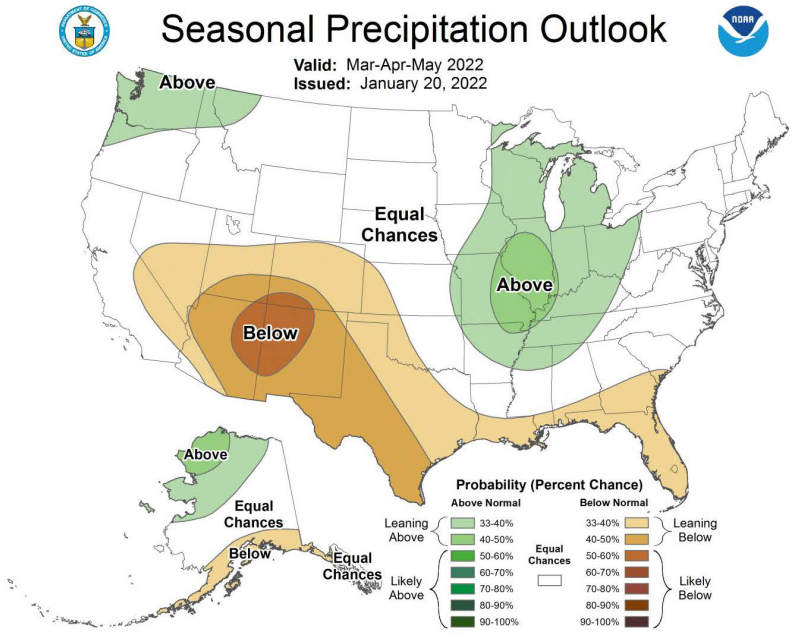
More information available at :
http://cals.arizona.edu/climate
http://www.climas.arizona.edu
Questions /comments? Contact Mike Crimmins, crimmins@email.arizona.edu



Precipitation notifications on myRAINge Log

MyRAINge Log is a web application and smartphone ready app built to track cumulative precipitation observations collected in simple, cumulative gauges at remote sites. This tool was designed with ranchers and land managers in mind and has been under development over the past several years with new features and refinements being added every couple of months. The latest feature, which was requested by users at training workshops, is a notification system built into myRAINge Log that indicates if precipitation has been detected at your gauge locations based on gridded precipitation estimates. The notifications can be tailored to provide alerts every time precipitation amounts cross a set threshold amount and can alert you every day this occurs or only when the cumulative amount over a series of events occurs. The notifications automatically show up as orange rain drops within the app, but can also be received as email alerts to remind you to check precipitation totals at your gauges. Notification settings are available under each gauge page in the 'Preferences' section. You can turn email notifications on or off for each gauge individually. Check out this feature and other myRAINge Log features at https://myraingelog.arizona.edu/

The March-May seasonal precipitation outlook issued by the NOAA Climate Prediction Center in mid-January depicts an increased chance of below-average precipitation across most of Arizona with the largest shift in odds toward drier-than-average conditions across the eastern half of the state. La Niña conditions developed in the late fall and have persisted through the winter season. This event is expected to weaken through the spring, but will still have potentially large impacts on the weather pattern across the Southwest with a high likelihood of drier-than-average conditions persisting over the next several months. This is due to La Nina's impact on the winter storm track which typically shifts away from Arizona in the late winter/early spring season. This was evident, especially in January, as dry conditions returned to the Southwest. Temperatures are also expected to be above-average over the next three months in concert with the drier than average conditions. More info available at https://www.cpc.ncep.noaa.gov/products/predictions/long_range/



Arizona Seasonal Climate Summary— Winter 2021-22

Virtual Fence Project Overview

George Ruyle
Professor and Extension Specialist, Rangeland Ecology and Management

Ranching serves as a nexus of economics, culture, and conservation in the Southwest. A new research initiative, funded by the Marley Foundation for Sustainable Rangeland Stewardship and the Arizona Experiment Station provides a major step in integrating traditional livestock production practices with emerging technologies and novel research to meet the challenges of a changing world. This public-private partnership between the University of Arizona School of Natural Resources and the Environment (SNRE), the University of Arizona Santa Rita Experimental Range (SRER) and the Santa Rita Ranch LLC will engage emerging virtual fence technology developed by the Vence Corporation (http://vence.io/) for livestock management and ecological research. This research effort has broad ecological and economic implications for rangeland management and livestock producers.

Virtual fence technology operates as a network of GPS-enabled cattle collars (Vence CattleRider™) that transmit data via a long-range radio network (LoRaWAN) to a radio gateway, which then relays that data to a web-based application (Vence HerdManager™). Virtual fence collars use the GPS location of each animal paired with low-stress auditory and electrical stimuli to alert animals if they try to cross a virtual fence boundary. Animals learn the location of these virtual boundaries, and are effectively contained within an area (or prevented from entering an area) without the need for physical fencing (e.g., barbed wire). Virtual fences are created within the HerdManager™ application and the boundaries of each virtual fence are transmitted to the collars via the internet and the long-range radio network, allowing the collars to be used in areas without cellular coverage.

Virtual fences can be used for multiple rangeland applications, including establishing pasture boundaries, implementing rotational grazing strategies, or prohibiting access to features such as roadways or ecologically sensitive areas with increased flexibility and decreased cost compared to physical fences (e.g., barbed wire). Virtual fences can be established (or removed) rapidly and with little effort by creating (or deleting) boundaries in the web application, and those changes are rapidly downloaded by the collars. Virtual fence technology can also assist with livestock management, as GPS data relayed from the collars can also be used to locate lost, sick, or escaped animals in real-time. Baseline biometric data is also relayed for each animal, including movement status and inactivity notifications, potentially indicating sick or deceased animals.

University of Arizona researchers will examine multiple factors related to overall virtual fence function and efficacy, as well as the economic metrics of implementing virtual fence technology. Virtual fence functionality and utility will be assessed through a variety of real-world herd management trials with the results disseminated to producers and land managers via lectures, meetings, reports, and digital media through University of Arizona Cooperative Extension. Economic metrics related to cost/benefits analysis of implementing virtual fencing compared to physical fencing will be conducted in conjunction with the University of Arizona Department of Agricultural and Resource Economics. These assessments will be used to better quantify return on investment for producers at the commercial scale.

University of Arizona researchers will also examine multiple dimensions related to grazing ecology and interactions of livestock on rangelands. GPS and biometric data will be related to landscape and environmental variables to quantify resource selection preference of livestock over both space and time. This information can be used to better determine the environmental cues cattle use when making decisions on what, where and when to graze. When coupled with the virtual fence technology's ability to move cattle remotely, this novel approach aims to one day allow producers to develop a dynamic grazing system that maximizes quality forage intake while more evenly distributing grazing across the landscape, a win for livestock, producers and rangelands. University of Arizona researchers will also examine the efficacy of using virtual fencing to utilize livestock grazing as a management tool for fuel load reduction for fire prevention and invasive species control. The data associated with this research effort will be made publicly available for further analysis via online data management portal.

Development of adaptive management strategies play a key role in addressing the ongoing challenges posed by a dynamic climate and the growing need for natural resources. The integration of novel technologies combined with established agricultural knowledge and methodologies has the potential to develop mutually beneficial outcomes for both the ranching community and the environment.

[1] Research and Extension team members include George Ruyle, Brett Blum, Sarah Noelle, Andrew Antaya, Brandon Mayer, Larry Howery, Mitch McClaran, Joslyn Beard, and Dari Duval, all from the University of Arizona, and Andrew McGibbon and family, Santa Rita Ranch.

Southern AZ Beginning Farmer & Rancher Workshop Series. More information and registration can be found at: https://tinyurl.com/Shejccdt (Or scan QR Code on flyer above)

2022 Range Livestock Workshops. March 8, Willcox Livestock Auction – Willcox, March 9, Gila County Fairgrounds – Globe, March 10, Navajo County Fairgrounds – Holbrook. For more information or to register, go to: https://extension.arizona.edu/events/2022rangelivestockworkshop

Or scan QR Code

Hands-On Artificial Insemination Clinic
March 25-27 at V Bar V Winter Headquarters in Rimrock, AZ
To register contact Lydia Watts at Yavapai Count Cooperative Ext. 928-445-6590. To view the full agenda go to:
https://tinyurl.com/VBVAIClinic

or scan QR Code

44th Annual AZ/UT Range Livestock Workshop & Tour
March 29-31
To register go to: https://tinyurl.com/AZUTRangeLivestock

or scan QR Code

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