Arizona Range and Livestock News
ARIZONA COOPERATIVE EXTENSION

August 2022

Arizona Walnut

Juglans major

Arizona walnut is found almost throughout the state along streams at elevations from 3,500 to 7,000 feet. A tree up to 50 feet tall, it can have a trunk diameter of four feet, though most of the time it is smaller than this. It has wide spreading branches and makes a good shade tree. Arizona walnut trees produce a thick shelled nut much smaller than English walnuts.

Monitoring Minute: Fetch

Fetch is the distance from the nearest perennial plant base within 360° of the quadrat point on a frequency frame. Fetch, reported with descriptive statistics, relates to plant distribution and watershed characteristics. Perennial plant cover can reduce soil erosion by creating an obstruction, which in turn slows the rate of overland flow. A shorter distance between perennial plant bases lessens the opportunity for water to acquire energy that is needed to remove soil and litter from a site. Over time, this information can be used to assess changes in the spatial distribution and connectivity of vegetation patches and document trends in the fragmentation of plant cover on rangelands for the purposes of assessing rangeland health.

Some General Ground Rules:

- One hundred points are measured from a consistent ground cover point.
- Distances are measured to the nearest inch.
- If live vegetation is hit on the ground cover point, the distance is zero.

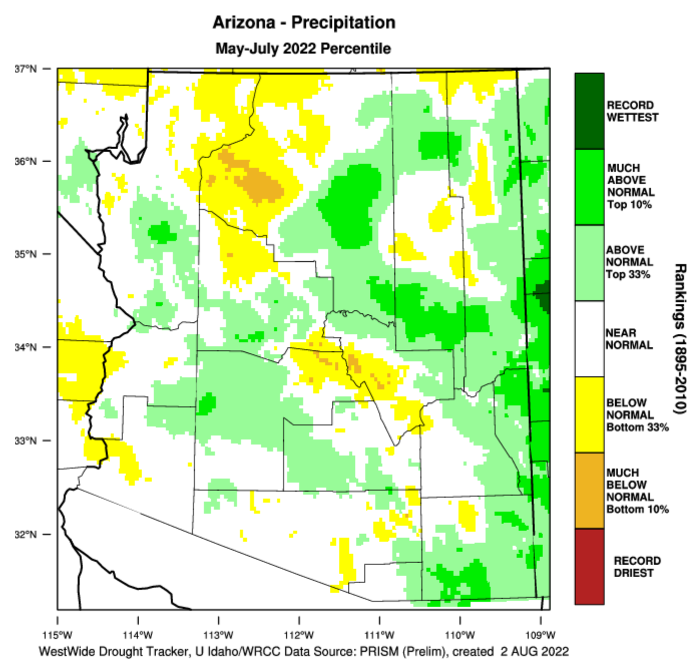
Download Full Color PDF: https://tinyurl.com/ClimateSummary22

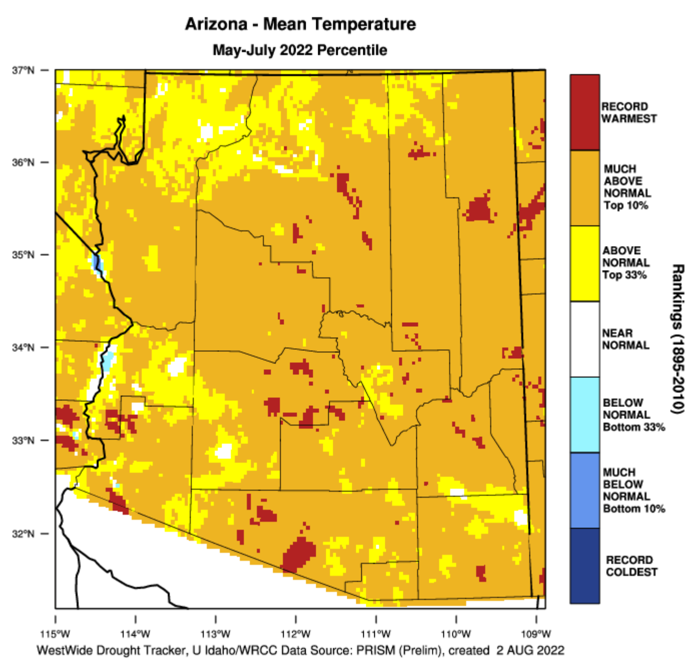
Arizona Seasonal Climate Summary: Summer 2022

Aug 1, 2022 - The past three months (May through July) were characterized by unusually warm and dry conditions in May giving way to an early start to an active monsoon season in June that persisted through July. The dry conditions in May were particularly extreme, even for this typically dry month. There were no precipitation events across any part of Arizona in May and temperatures were much above-normal. This caused short-term conditions to continue to slide into deeper levels of drought. By the end of May, over 75% of Arizona was observing 'severe' drought or worse according to the May 31st update of the U.S. Drought Monitor.

Thankfully, monsoon moisture pushed up into the Southwest quite a bit ahead of schedule in June. By the middle of the month precipitation had started to fall across the higher elevation areas of central and eastern Arizona. More widespread precipitation occurred later in June that pushed out into the lower elevation western desert areas. A favorable monsoon ridge position ('Four Corners High Pressure') helped keep deep monsoon moisture in place and supported daily rounds of thunderstorm activity. By the end of July, much of Arizona was observing above-average monsoon season precipitation.

Overall, most of the state observed above-average precipitation for the May-July period except for some isolated areas in northern Coconino and western Gila counties that were still waiting for heavy monsoon rains. Temperatures were much above average over this period as well, with notable heat waves in early June and again in early July.





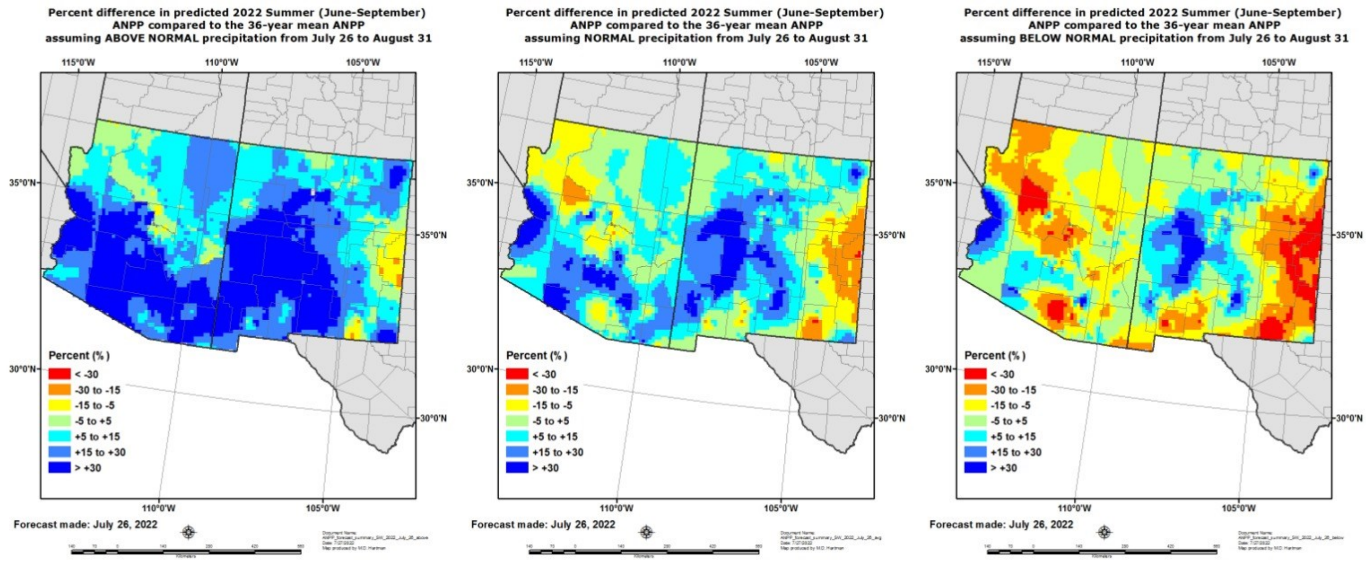
November-January precipitation and temperature rankings from the WestWide Drought Tracker

(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

% Change in Grassland Production for Your Area this Summer Compared to Its 36-yr Average - Forecast Made: July 26, 2022

For the 3 maps(scenarios) below: "If precipitation between now and August 31st is above (left map), near (middle), or below (right) normal, we estimate that grassland production in your area this SUMMER (at lbs / acre of peak biomass on September 30th) will be ___% more or less than its 36-year average."



To check the precipitation outlook between now and August 31st for your specific location, please visit NOAA's outlooks at: https://www.cpc.ncep.noaa.gov/products/forecasts/.

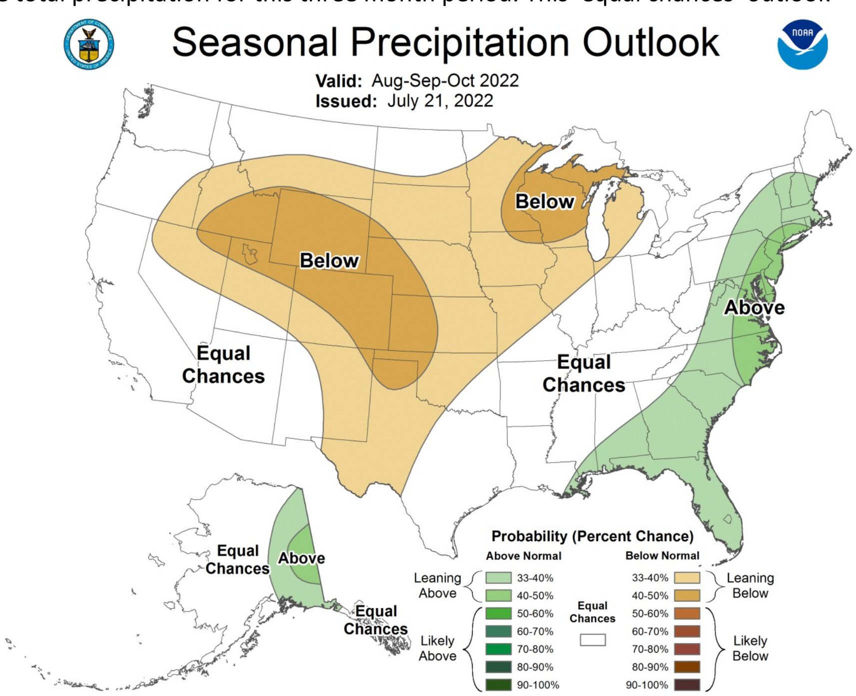
USDA

Natural Resources Conservation Service
Agricultural Research Service
Climate Hubs

Find current maps at: https://grasscast.unl.edu/
See NOAA Outlooks at: https://cpc.ncep.noaa.gov/products/forecasts
For additional drought info & resources: https://drought.unl.edu/
USDA is an equal opportunity provider, employer, and lender.

Grass-Cast is a new, experimental grassland productivity forecast product developed by researchers with the USDA, University of Arizona and Colorado State University to support ranchers and land managers by making forecasts of vegetation productivity. The system uses 40 years of historical weather and vegetation growth combined with seasonal precipitation outlooks (https://www.cpc.ncep.noaa.gov/products/predictions) to predict if an area (6 by 6 mile grid cell) is likely to produce above, below or normal amounts of productivity based on these historical records and precipitation outlooks. Three maps are produced for each forecast and correspond to the above/normal/below precipitation outlooks (more info at https://grasscast.unl.edu/)

The August through September seasonal precipitation outlook issued by the NOAA Climate Prediction Center in mid-July depicts equal chances of normal, above or below average total precipitation for this three month period. This 'equal chances' outlook indicates that there isn't a strong forecasting signal to suggest either above or below average precipitation for this period. The August through October period is a transition out of the monsoon season into fall. Current La Nina conditions may continue to impact the east Pacific tropical storm season which may lead to less chances for widespread rainfall later in September and into October, but uncertainty remains high. Temperatures are expected to be above average over this period though. The temperature outlook for Aug-Sept shows all of the Southwest under an increased chance of above-average temperatures for this period. Stay tuned to updates here https://www.cpc.ncep.noaa.gov/products/predictions/long_range/



Controlled Breeding Seasons

Dr. Joslyn Beard, State Livestock Extension Specialist

Most of Arizona's cattle producers are faced with a harsh reality of managing their herds on large diverse rangelands, leading to very little access to their cattle herds which often is the cause for year-round breeding seasons. Producers who use a year-round breeding plan also believe that is the only way to breed all the females in their herd as it gives each heifer or cow a chance to conceive and produce a calf. Logically sure that makes sense, the longer the bull is out with the females a pregnancy is bound to happen. However, if we take a step back and look at the fundamental objective of a cow in the herd, the expectations are that female's ability to conceive a calf, have a successful pregnancy, and wean a marketable calf at minimum once a year. Having a year-round breeding season can be troublesome in making sure that cow is doing her job, therefore considering a controlled breeding plan can help sort the unproductive cows from the herd.

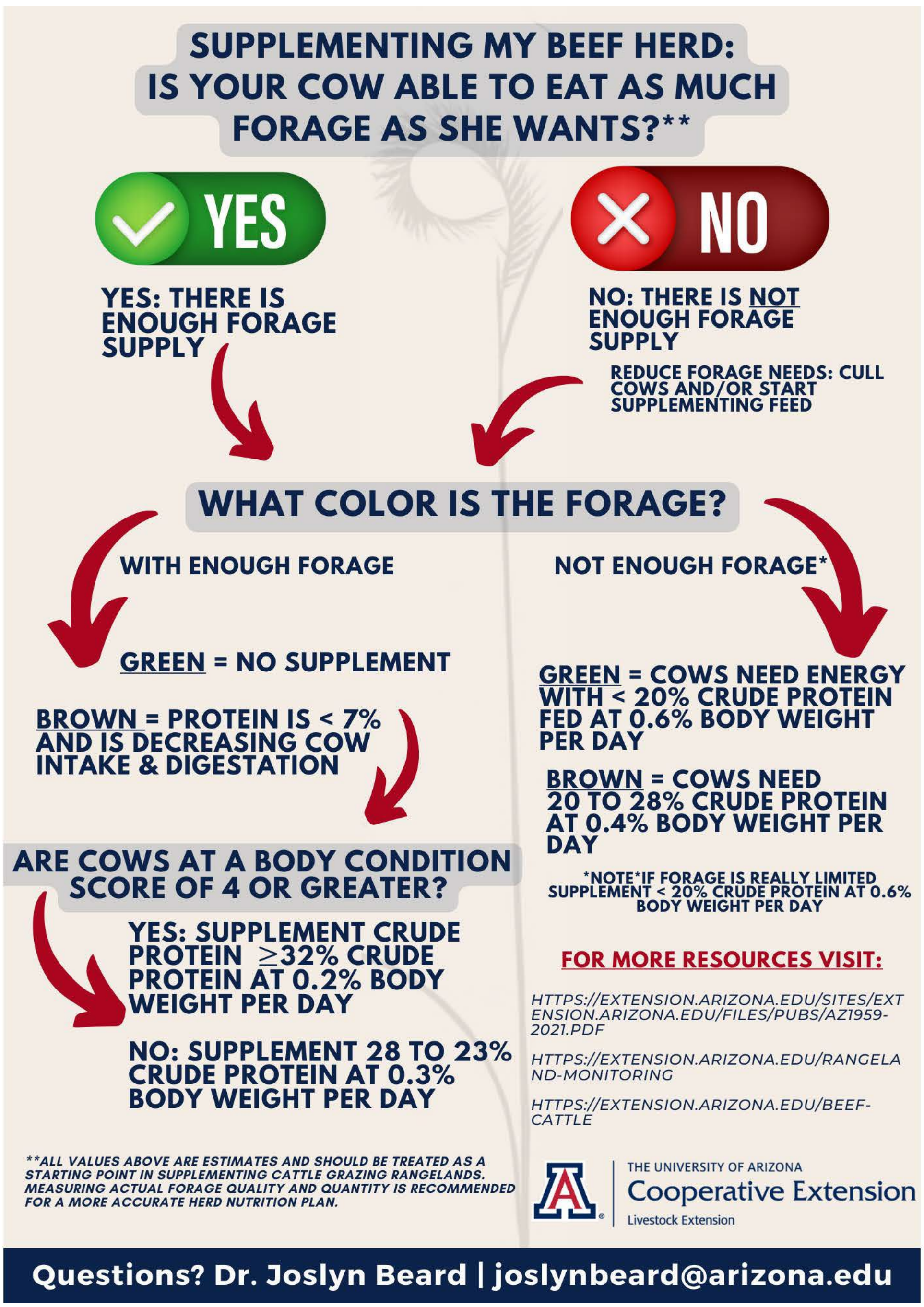
Pregnancy in cattle is about 282 days, meaning that female has roughly 80 days to recover from the pregnancy by starting to cycle again and get bred for the next calf crop. Coincidentally, in the time she calves and starts nursing this also is the time where her body is going to need the most calories to provide enough milk for her calf, maintain her body weight, and then get pregnant for the next year. So, it would make sense to match the calving season when forage quality is at its highest or when the forage has the most nutrients. We use this knowledge and combine it with a marketing plan, of when we want to market cattle in the year. This creates 2 popular calving seasons, spring and fall, which will allow cattle to match their highest nutrient needs when forage quality is the highest along with hitting two different cattle markets when selling those calves. This then comes down to two questions: which calving window do I hit and how do I move from year-round calving to a controlled calving season?

Choosing a calving season is honestly dependent on your management practices. By answering what needs to be done and when it needs to be done, can help you choose a season. For example: if you need to gather up you herd for weaning in October what does the feed situation look like or labor look like compared to weaning in March? If you shift when you market your calves does your environment support the change or do you have the resources to supplement cattle when necessary (feed, water, mineral, fluctuation of stocking rate on pasture, etc.)? Once you have a calving season, now we back track to our breeding season. Transitioning from a continuous versus controlled breeding season does take time to do, like 3 or 4 years before your herd will shift completely if you gradually implement a controlled breeding season. If you want to choose a rapid route, you can transition your herd in one year however you will **lose 1 year of calf** crop. Ether option you choose though, you'll have to make sure you have adequate labor to pull bulls and adequate corrals or fences to house the bulls from the cows.

What do that switch look like? For a gradual transition, pick your calving season then back track to when your breeding season will need to happen. For spring calving systems (March - May) our breeding season will be start in late-May or early-June and we can start with a 180-day breeding season. For example, on June 1 we will introduce the bulls and pull them from the herd on November 28, which is 180 days later. The bulls will hang out away from the cows until you can do a pregnancy check, roughly 45 days after bulls were pulled, and cull like you normally would with open cows getting sent on the truck. However, if you want to be super critical in shifting you breeding season, you can also cull any bred cows that are pregnant outside of your breeding season window, but that can be optional and on a per cow basis dependent on how far out of the window they're bred. The next year we can tighten our breeding window by going from 180 days to 140 days and continue to do this each year until you achieve your desired breeding/calving window such as 60 or 90 days.

Transitioning from a continuous to controlled breeding season will take a good management plan and discipline to carry out. Accurate records with detailed yearly plans, and a 5-year goal will be critical in the success of setting a defined breeding season. However, the ultimate outcome of transitioning your herd will improve management practices by decreasing labor, decreasing nutritional needs throughout the year, and can increase efficiency and overall profit when paired with proper management.

If you have any questions, please feel free to reach out to Dr. Joslyn Beard at joslynbeard@arizona.edu or at 520-626-9532.



RESEARCH CORNER

Virtual Fence

The Santa Rita Experimental Range (SRER), near Green Valley, Arizona was established in 1902 and is the nation's oldest experimental rangeland. The Santa Rita Experimental Range serves as an open-air laboratory for researchers and scientists across the country. A research group from the University of Arizona under the direction of Dr. George Ruyle began testing virtual fence technology on the Santa Rita Experimental Range in September 2021. Virtual fence technology is a system of GPS collars that send auditory and electrical signals to train cattle to stay out of undesired areas, or keep cattle within desired areas, by creating virtual fences through a web application. Virtual fence technology does not require cattle to be within areas of cellular coverage, as the virtual fence collars use separate radio gateways to transmit data from the collar and receive instructions from the end user. Currently, the project run by the University of Arizona has over 400 virtual fence collars deployed across two herds of Red Angus cattle and covers over 52,000 acres of rangeland. This on-going study aims to understand the effectiveness of virtual fence technology to contain cattle within desired areas to enhance protection of natural resources, the application of virtual fence technology to implement grazing management, such as grazing rotations, and to examine the economic costs and benefits of virtual fence technology for the producer. Preliminary results indicate that virtual fence technology was able to exclude over 90% of cattle from riparian areas, which suggests that virtual fences may be able to replace physical fencing to protect sensitive areas in some circumstances. This is both a benefit to producers and land managers, as natural resources are protected, infrastructure costs are reduced by reducing or eliminating the need for barbed-wire fencing, and cattle can continue to graze within the pasture. Additionally, virtual fence technology is currently being used to rotate cattle passively through a grazing rotation by allowing cattle to move to new pastures on their own, and then blocking their return to previously grazed pastures with virtual fences. The ability to move cattle to new pastures with virtual fence technology is likely to benefit producers by reducing labor costs associated with rounding up and moving cattle to new pastures. Private partners in the virtual fence study also state that knowing the location of cattle is a big benefit to producers, as straggler cattle are much easier to locate and the process of rounding up cattle that used to take weeks can now be done in just a few days. The Santa Rita Experimental Range is the ideal place to test real-world applications of virtual fence technology for producers in Arizona. Be on the lookout for more educational materials on virtual fences to be released in the coming months.

If you have any questions, please feel free to contact Andrew Antaya (aantaya@arizona.edu) or Brandon Mayer (butterzs@arizona.edu).

Recent advances in the impact of heat stress in beef finishing cattle under controlled heat stress conditions

Andrea Rios, Pablo Grijalva, and Duarte Diaz
School of Animal and Comparative Biomedical Sciences, CALS, The University of Arizona

Supplementation with a β-adrenergic agonist (β-AA) of different breed beef steers under heat stress conditions (HS) was evaluated with respect to feedlot performance and carcass merit. Angus (AG) and Brahman (BR) cattle were housed in controlled environment chambers with one of two environmental (ENV) conditions 1) heat stress (HS; THI = 73 to 85) and 2) thermoneutral (TN; THI = 68) with either Zilpaterol hydrochloride (ZH) or soymeal supplementation (CN) in two different research projects over a two-year period. The risk of HS is measured using Temperature Humidity Index (THI) which is calculated using an equation that takes in consideration environmental temperature and relative humidity (Figure 1).

Figure 1. Beef Cattle Temperature Humidity Chart

Beef Cattle Temperature Humidity Chart

Temperature (°F)	Relative Humidity (%) 30	35	40	45	50	55	60	65	70	75	80	85
100	84	85	86	87	88	90	91	92	93	94	95	97
98	83	84	85	86	87	88	89	90	91	93	94	95
96	81	82	83	85	86	87	88	89	90	91	92	93
94	80	81	82	83	84	85	86	87	88	89	90	91
92	79	80	81	82	83	84	85	85	86	87	88	89
90	78	79	79	80	81	82	83	84	85	86	86	87
88	76	77	78	79	80	81	81	82	83	84	85	86
86	75	76	77	78	78	79	80	81	81	82	83	84
84	74	75	75	76	77	78	78	79	80	80	81	82
82	73	73	74	75	75	76	77	77	78	79	79	80
80	72	72	73	73	74	75	75	76	76	77	78	78
78	70	71	71	72	73	73	74	74	75	78	76	76
76	69	70	70	71	71	72	72	73	73	74	72	75

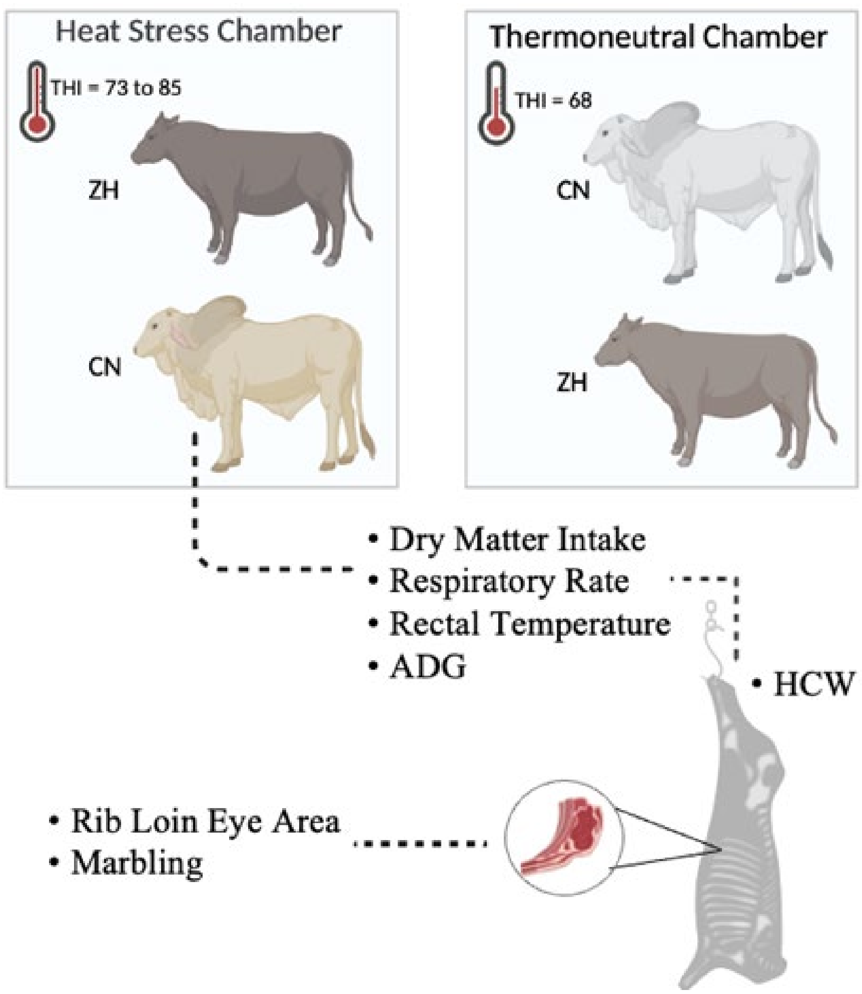
Temperature Humidity Index (THI)

Normal <75 | Alert 75-78 | Danger 79-83 | Emergency >84

Note: The image was adapted from *Handling cattle through high heat humidity indexes*. UNL Beef. (2014, June). Retrieved August 15, 2022, from https://beef.unl.edu/handling-cattle-through-high-heat-humidity-indexes

Daily data were collected for dry matter intake, respiratory rate (RR), rectal temperature (RT), average daily gain (ADG), and gain to feed (G:F). At the end of 21 d periods, animals were harvested, and hot carcass weight (HCW) was measured. After 7 days of chilling, rib loin eye area and marbling score were determined (Figure 2). There were only marginal differences (P > 0.05) in feedlot performance, suggesting that supplementation with ZH did not negatively impact growth, carcass performance, and carcass merit in heat-stressed steers. This is of relevance to the industry due to previous reports that speculated that supplementation with β-AA would have negative impacts during periods of high temperature and humidity. Our data supports that β-AA supplementation improved efficiency and as a result does not further amplify heat stress related physiological responses. Heat stressed Brahman (HSBR) and Angus (HSAG) presented higher RR throughout the 21 days of experimentation, regardless of supplementation (P < 0.05). An increase of 162 % in breaths per minute was shown in stressed Angus. Environment and day interactions (P < 0.04) were observed for RT, HS Brahmans steers had a greater RT on d 8 but similar RT on d 15 and 19. Supplemented Angus steers in HS and TN and control steers in TN had lower RT than HSCN steers on d 11, 15, and 19 (P < 0.05). However, stressed Brahman tends to have a constant decrease after d 12 (P > 0.05). Bos indicus steers showed more thermoregulation with fewer adverse effects on growth and carcass characteristics than Bos taurus, demonstrating a possible benefit of utilizing ZH under stressful conditions.

Figure 2. Brahman and Angus methodology research.



EVENTS | A LOOK AT WHAT'S HAPPENING

THE UNIVERSITY OF ARIZONA
Cooperative Extension

Graham County Cooperative Extension Cattle Nutrition Workshop
Friday October 14, 2022 5:30PM-8:30 PM
Activities Center at Eastern Arizona College
615 N. Stadium Ave Thatcher, AZ 85552
Dinner $10/person

Discuss the impacts of nutrition and forage intake on cattle immune and reproductive systems from industry experts.
Kim McReynolds – Greenlee County Extension Director and Area Agent, Natural Resources
Dr. Joslyn Beard – U of A State Livestock Extension Specialist
Dr. John Wenzel – Extension Veterinarian, NMSU

(Two BQA Credits offered at this workshop)

RSVP by contacting Nate Brawley 928 965 3188 nqbrawley@arizona.edu

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