



Sustainable Southwest Beef CAP Newsletter

January 2023

A Message From The Leadership

We are excited about our project as we head into 2023. We are well into our 4th year, meaning that there have been an abundance of research, extension, and education accomplishments that are already making an impact but we also have time to continue on the multitude of student projects, education workshops and events, research findings and extension materials and outreach to communicate the project to a diverse stakeholder audience.

Even more exciting is the recent arrival of Samantha Lish as our Program Manager after nearly a year with that position vacant. Many of you may be unaware of all that the Program Manager does to streamline communication, coordinate activities, comprehensively document our accomplishments, and manage the budget. During the past year, those of us on the Steering Committee and Team Lead positions became painfully aware of how much of our time it was taking to try to cover these responsibilities. Since joining Sustainable SW Beef, Samantha has taken on communications and coordination with team leaders and members. She will be a key member of the Annual Meeting planning committee. She has prepared clear and complete budget reports that help fundholders plan the priorities for the remainder of the project. And she is developing a system to systematically document and archive our publications, presentations, events, and other accomplishments. This will be essential moving forward to be able to quickly and efficiently document the outputs and outcomes of everyone's good work. As Samantha has taken on more and more organizational tasks, the Program Directors and Steering Committee have been able to refocus on the research, extension, and education goals and efforts underway.

Although Samantha was born and raised in Las Cruces, NM she hails from a ranching family who has been ranching in Northeast NM since the late 1800's. She has worked at New Mexico State University since 2010 and holds a B.S. degree in Agriculture as well as a Bachelor and Masters of

Accountancy all from NMSU.

Welcome Samantha!



Welcome!

Edgar Corrales Sotelo is an MS student of Data Analytics under Dr. Huiping Cao and will conduct Machine Learning experiments to evaluate cow behavior data.

Tiana Nez is an MS student of Rangeland Science and joined the Precision Livestock Ranching research in the summer to work under the supervision of Dr. Casey Spackman. Tiana's work included the use of high-resolution drone imagery to derive site-specific estimates of rangeland plant biomass.

Amelia Ahles is a Ph.D. Candidate in the Department of Agricultural Economics at Texas A&M University. In her research associated with the Sustainable Southwest Beef Project, Amelia is using experimental methods to provide information about consumer preferences and willingness to pay for sustainable Criollo beef. This work will aid in identifying the consumer market interested in purchasing Criollo beef and how to effectively promote Criollo beef to consumers.

Kudos

Dr. Santiago Utsumi was promoted to an Associate Professor in the department of Animal and Range Sciences. Congratulations Santiago!

A big thank you to the feedlot staff at the James Bush Farm – most notably Jarret Proctor, Ryan Foster, Johnny Bible, and Lupe Garcia – for a tremendous amount of exceptionally high-quality work building and equipping our new Research Feedlot at JBF with a concrete feeding apron, steel fences and gates, heated water fountains and plumbing, both line-

power and solar electrical systems, and C-Lock SmartFeeds. Jarret, Ryan, Johnny, and Lupe started from scratch and replaced some temporary pens with eight identical pens and did all of the work except pouring the concrete, getting the whole thing finished, beautifully square, and fully operational in time to receive the second herd of Criollo/[Br]Angus calves and feed them individually. It was a huge project for them, and they did a fantastic job that we will be delighted to show to the project team in March at our annual project meeting.

The Sustainable Southwest Beef Project was named the recipient of the Texas A&M AgriLife Vice Chancellor's Partnership Award. Dr. Brent Avermann accepted the award on behalf of the Partnership and will recognize the team at our project Annual Meeting Amarillo. In addition, Dr. Marco Palma, Professor of Agricultural Economics at Texas A&M University and member of our Supply Chain research team won the Texas A&M AgriLife Vice Chancellor's Research Award. Congratulations all! To read more about these prestigious awards, click [here](#).

Dr. Craig Gifford and Dr. Santiago Utsumi were awarded a one year USDA – National Institute of Food and Agriculture grant for their project “Implementation of virtual fencing technology to build resiliency of agriculture systems impacted by wildfire and subsequent flooding”. You can read more about this exciting project [here](#).
Way to go!

Extension Team Update

The extension team has had a busy fall! One of the goals we'd set last year was to increase our support and collaboration with the education team by doing some outreach to 4-H and FFA state advisors to share the project-related lesson plans developed by Asombro Institute for Science Education. We recently reached out to the State 4-H Agent, State FFA Advisor, and Farm Bureau's Ag in the Classroom program point of contact in each of the 9 Southwestern and Southern Plains states that are in the Sustainable Southwest Beef Project's general footprint, plus Hawai'i. Hawai'i is served by the Southwest Climate Hub and might have some interest in the lesson plans also. So far, we've heard back from contacts in six of these states (AZ, CO, KS, NM, NV, TX), all with a very positive response. Those whom we've heard back from thus far have indicated that they are either passing along or in some way making available the information and materials to those working within their respective programs. It is truly heartening to see such enthusiasm over the lesson plans that our partners at Asombro worked so hard to create. Great job Education Team!

We've also been working on new fact sheets to share at events and through our website, and of course directly with contacts. We are pleased to announce a new [Virtual Fence Collars](#) fact sheet, as well as Spanish

translations of our three previous fact sheets on LoRaWaN enabled GPS collars, rain gauges, and water level sensors. These translated ones come courtesy of (and many thanks to) Dr. Maximiliano Spetter and Andrés Perea from the precision ranching team. All of these fact sheets can be found on our website under “[Resources>Fact Sheets](#)”.

Dr. Craig Gifford and Dr. Santiago Utsumi are leading a one-year, NIFA-funded project, to make use of virtual fence collars in parts of the Gila National Forest where hundreds of miles of physical fences were destroyed in the extensive 2022 Black Fire. With the rangeland now recovering, producers are faced with the predicament of grazeable land but no way of maintaining the boundaries between grazing allotments with the fences gone. Virtual fence systems will provide an immediate solution to this problem while permanent fences are being re-built. The project will involve 300 cattle across three ranches and grazing allotments covering thousands of acres of rugged rangeland and open savannas. The cattle will be collared for a year. We are interested to see how this project turns out, as well as what these ranchers’ opinions on precision ranching technologies are at the conclusion of the project.















Finally, we’re starting to prepare for our 2023 On-Ranch Demonstration, which will be held at the beautiful Corta Madera Ranch in Pine Valley, CA, on May 4th. Ranch managers Rob Paulin, and now Jeremy Walker, raise Raramuri Criollo cattle on the ranch, breeding their Criollo cows to Angus bulls to produce a marketable calf. This event will be a great opportunity to come out and see the cattle and ask Rob and Jeremy about their experiences raising and working with this heritage breed. We will also have some of our precision ranching equipment on-site and someone to demonstrate how it all works. Registration isn’t open yet, but if you’d like to add your name to a list to be contacted when it does open, please provide your email address in [this form](#). Contact Skye Aney (sierra25@nmsu.edu)

with any questions. The event will be free and lunch is provided. We'd love to see you there!

Sustainability Indicators

Jornada scientists and technicians, in collaboration with the [LTAR](#) Indicators Working Group has been diligently building a framework to identify indicators and metrics to measure the status of six key attributes of ranch-level sustainability. We have now incorporated the exceptional feedback garnered at last year’s annual SW Beef CAP meeting (May 2022 at the Jornada) to prioritize the first metrics to be measured at each of our cooperating ranches. These metrics will help us determine how well each treatment (precision grazing or heritage genetics) performs in relation to themselves (e.g., Angus vs Criollo), each other, but also in relation to predetermined benchmarks of sustainability. Our aim is to measure whether farming or ranching systems are sustainable, i.e., whether they satisfy the needs of the farmer or rancher today while conserving natural resources for future generations. We are interested in six broad attributes that include land and water health, atmospheric health, production abundance and quality, financial stability, human health, and social cohesion. We aim to begin sampling one indicator per attribute at each of the cooperating ranches beginning this year.

The table, below, details the hierarchy of domains, attributes, indicators, and hypotheses regarding different aspects of the heritage genetics project. Note that new metrics are listed, which we aim to collect data for in response to prevailing theories and associated indicators and domains. This example illustrates differing tradeoffs between breed types may exist and shows how we can benchmark levels of sustainability across domains to evaluate whether or not each breed meets preset goals.

Sustainability domain	Attribute	Indicator	Behavior and landscape use research informing hypothesis	Hypothesis about outcomes of producing Criollo	New metrics to be collected
	Land & Water Health	Biotic integrity		Larger home ranges and fewer grazing hotspots maintain grass cover, limit bare ground, and limit opportunities for establishment of invasive species.	In grazing footprint: Remotely sensed and field measured trends in cover of grasses, shrubs, bare ground, and invasive species.
		Soil quality		Larger home ranges and fewer grazing hotspots improve soil health over long term.	In grazing footprint: Soil/Site stability.
	Atmospheric Health	Greenhouse gas mitigation		Larger home ranges and fewer grazing hotspots maintain soil carbon pools over long term. Breed foraging behavior and physiology affects methanogenesis.	In grazing footprint: Soil/Site Stability; remotely sensed net primary production. Methane production by cattle.
	Production Abundance & Quality	Total factor productivity		Ratio of outputs to inputs is higher due to fewer inputs.	Inputs (land, labor, fertilizer, machinery) ÷ outputs (livestock).
		Commodity quality		High temperatures minimally affect animal performance due to heat tolerance.	Body condition score. Weaned calf weight as % of dam weight.
		Water use efficiency		Breed foraging behavior and physiology result in less freshwater intake to support weight gains.	Livestock water productivity as gain per head per day ÷ m³ of water intake from troughs.
	Financial Stability	Stability of profits		Net returns are steady despite variation in forage and cattle prices due to adaptive capacity of cattle.	Annual operating and overhead costs and cattle sales.
	Human Health	Flexibility		Ranchers have greater flexibility in viable plans and work schedules due to adaptive capacity of cattle.	Rancher time to plan and learn.
	Social Cohesion	Community security		Social capital is higher due to desired sustainability outcomes, animal heat tolerance, and rancher social learning.	Rancher connection to community. Rancher co-production with neighbors.

Big Plans for 2023 from the Asombro Education Team

Now that the Asombro Institute for Science Education has almost reached our goal of developing ten [K-12 lessons](#) related to the Sustainable Southwest Beef Project, we are ready for the next stage in 2023. This year, the focus will be (1) updating all lessons with the latest scientific discoveries coming from the project, (2) teaching the lessons to hundreds of students in southern New Mexico, and (3) hosting teacher workshops in New Mexico, Oklahoma, and Utah to expand the project's reach even further.

Teachers who have attended our previous workshops gave them rave reviews. For example, at a workshop Asombro hosted on October 22, 2022, teachers wrote many comments like these in anonymous post-workshop evaluations:

- “I love that these programs honor the heritage of agriculture in this area while also teaching how we can do better for the environment.”
- “I think that the sustainable beef is right on target with interests for our area. As someone who is not from here, it is great to learn more about ranching in the SW and problems that our students can think about/help solve.”

Dates, locations, and more details about teacher workshops will be posted soon. Check <https://asombro.org/teacher-workshops/> or contact stephanie@asombro.org for more information.

C-Lock GreenFeed Smart Feeders Have Arrived



The GreenFeed systems are used to measure gas production from ruminants. The pasture systems are set up with solar panels and can be moved from pasture to pasture. When the animals place their heads in the system to eat a “treat” gasses are measured from the

animal. The gasses that can be measured are carbon dioxide, oxygen, and methane. With these gasses, we will be able to measure enteric methane emissions under different production situations. In addition, the gasses can be used to develop energy equations.

Upcoming events

May 4, 2023. On-Ranch Demonstration at Corta Madera Ranch in Pine Valley, CA. Free and lunch will be provided. Registration has not opened yet, to be contacted when it does, please add your information [here](#).

Publications and Links

Steiner, J.L.; Spiegel, S.; Elias, E.; Aney, S. “Beef Brief: A New Normal for Irrigated Agriculture to Sustain the Ogallala Aquifer” Sustainable Southwest Beef Project Policy Brief, November 2022.

<https://doi.org/10.5281/zenodo.7383476>

C. A. Gifford, K. M. Taylor, S. Spiegel, G. Duff, S. Aney, E. Elias, J. Steiner, R. Estell, Z. D. McFarlane, T. K. Schohr, K. L. DeAtley† and M. R. Banwarth “Factors important for bull purchasing decisions and management in extensive rangeland production systems of New Mexico: A producer survey” Translational Animal Science, December 2022.

<https://doi.org/10.1093/tas/txac167>

Gregory L. Torell, L. Allen Torell, Joy Enyinnaya, Sheri Spiegel, Rick E. Estell, Andres F. Cibils, Dean M. Anderson, Alfredo L. Gonzalez “Economics of Raramuri Criollo and British crossbred cattle production in the Chihuahuan desert: Effects of foraging distribution and finishing strategy” Journal of Arid Environments, April 2023.

<https://doi.org/10.1016/j.jaridenv.2022.104922>

Matthew M. McIntosh, Sheri A. Spiegel, Stacia Z. McIntosh, JoséCastaño Sanchez, Richard E. Estell, Caitriana M. Steele, Emile H. Elias, Derek W. Bailey, Joel R. Brown, Andrés F. Cibils “Matching beef cattle breeds to the environment for desired outcomes in a changing climate: A systematic review” Journal of Arid Environments, April 2023.

<https://doi.org/10.1016/j.jaridenv.2022.104905>



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