**Come Rain or Shine Podcast, Episode 2**

**The Sustainable Southwest Beef Project
Interview with Andres Cibils and Sheri Spiegal**

**Emile Elias:** Welcome to Come Rain or Shine, podcast of the USDA Southwest Climate Hub

**Sarah LeRoy:** And the Department of Interior Southwest Climate Adaptation Science Center for Southwest CASC. I'm Sarah LeRoy Science Communications Coordinator for the Southwest CASC.

**Emile Elias:** And I'm Emile Elias, Director of the USDA Southwest Climate Hub. Here, we highlight stories to share the most recent advances in climate science, weather and climate adaptation and innovative practices to support resilient landscapes and communities.

**Sarah LeRoy:** We believe that sharing some of the most forward thinking and creative climate science and adaptation will strengthen our collective ability to respond to even the most challenging impacts of climate change in one of the hottest and driest regions of the world.

**Emile Elias:** This week Dr. Sheri Spiegel is serving as a guest-host for Come Rain or Shine. Sheri is one of the principle investigators of the Sustainable Southwest Beef Project, and will be leading the conversation.

**Sheri Spiegel:** Hi, I'm Sheri Spiegel today we're here with Dr. Andres Cibils, who is a professor of range science at New Mexico State University to discuss what this project is, what our goals are and what it is we're researching and learning from each other. Hi Dr. Cibils.

**Andres Cibils:** Hi, Sheri.

**Sheri Spiegel:** Good afternoon. So I was wondering if you could just tell us a little bit about the Sustainable Southwest Beef Coordinated Agricultural Project. Just kind of give a brief overview.

**Andres Cibils:** Yes. Sure. So this is a fairly new project, was funded six months ago and is a regional project looking at uh, beef production from ranches in the Southwest, all the way to finishing in the Ogallala region and meat quality and consumers beyond that.

**Sheri Spiegel:** So it really covers a lot, doesn't it?

**Andres Cibils:** Yes, it does. So we are, one of the things the project is trying to do is to study how each of the phases of beef production are connected and how they affect the regions in which they happen. And what aspects can be improved to increase the sustainability of beef production in the West in general.

**Sheri Spiegel:** So why is it called a coordinated agricultural project?

**Andres Cibils:** The project involves cooperation among three important players. And so we have research occurring of course, and the research is informed by education and extension partners as well. So the project is led by New Mexico State University and the Jornada Experimental Range and is collaborating with extension specialists in New Mexico, in Texas, and with two education, K-12 education NGOs, one based in Las Cruces and the other one in Reno, Oklahoma.

**Sheri Spiegel:** That sounds great. So, yes. So, the researchers are actually learning from K-12 students somehow, or like, what are what's the connections there?

**Andres Cibils:** So one of the interesting aspects of this project is that we are trying to open channels of communication with tomorrow's consumers and producers and get feedback from them, especially regarding some of the technologies and some of the modeling exercises that we'll be doing. And some of the experiments as well, of course, that will be doing on the research side of the project.

**Sheri Spiegel:** Sounds pretty good. So, okay. So, so there's education, there's research and there's extension. So what's being researched?

**Andres Cibils:** We are focusing on three different strategies that we think could contribute to improve the sustainability of beef production in the region. And so the first strategy has to do with using heritage cattle breeds, basically crossing them with improved breeds to produce beef for the mainstream beef supply chain. But with a cow herd that we have found over the last 10 years interacts with the grazing environment, especially the drier grazing environments in the Southwest differently than some of our mainstream breeds.

So that is one of the focus areas. The second focus area is what we are calling precision ranching. And what that means is that we are trying to use sensors to improve the efficiency of beef production, especially at the ranch level. So we're using animal wearable sensors, sensors also to monitor infrastructure on the ranch that are meant to help a rancher save time and hopefully reduce the cost of running a cow calf operation. The third area of focus is the study of alternative supply chains for the beef production receiving input from producers to model other ways of finishing our beef and getting it to the market. So grass fed beef would be one example of an alternative supply chain that we would model. And at you, Sheri might have something to add here, because you know more about this than I do.

**Sheri Spiegel:** So I'm not only your host, I'm also someone working on the project. So, yeah. So for the, for that third strategy that the project is looking into, um, that we're researching we're considering the sustainability of different approaches to beef production from pasture to plate really. And it will be interesting. And maybe in a little bit to think about what sustainability means to us as project leads and people working on the project. But yes. So we're looking at a couple of different, actually a few different supply chain approaches. So one of them is finishing this heritage cattle on Southwestern rangeland. Another one is exporting calves from cow calf operations in the Southwest exporting those calves up to the Northern Plains. So like South Dakota for finishing on grass. And another one that we're looking at that is exporting those calves from cow calf ranches in the Southwest to the Ogallala aquifer for finishing. And the Climate Hub listeners might be interested to know that there are some kind of surprising, um, efficiencies or it could be surprising for some consumers, that grain finishing has some surprising efficiencies and savings in greenhouse gas production over time because the cows end up living shorter lives than if they're finished, in some cases, on grass or rangeland.

So we are really investigating these different outcomes of beef production and we're comparing environmental outcomes, economic outcomes, for producers. And we're really looking at the social and ecological linkages between the Southwest and the Ogallala aquifer region and looking at kind of the social and ecological connections there and asking the questions, what would happen if there would be changes in either the Southwest or the Ogallala aquifer region in beef production and how would that affect the other region?

So that is a key part of what we're trying to get after with that type of research. And we're learning really a lot from our partnering producers. So what I'm, one of the things I'm really excited about in the project is that we have five ranchers across the West who we're working with, who are going to use going to test that precision ranching system on their places, and who are willing to work with us to understand more about their production system and their agricultural inputs into their ranches. So we can learn more about their, the economic and environmental pros and cons of different types of production in on Western ranches. So that is another element that I know we're all excited about in this project.

Okay. So it's a five year project. So what do, what are we feeling like might be some of our key products from this work?

**Andres Cibils:** So, yeah, that's a, that's an excellent question. So of course we will be producing what all of these projects do and that is different types of publications reporting our results from academic publications to extension publications, to webinars and podcasts as well.

But what we also hope to do is to create what we're calling a Western Beef Knowledge System. It will basically, probably fulfill several roles, but one of them is to get a lot of the information out to consumers and producers, but also to elicit input from producers and consumers. And so it's where we are envisioning this tool as a two way exchange of knowledge or creating knowledge collaboratively from what we learned and the project and what we learned from these five ranchers we're working with, but also from other ranchers and consumers and other producers that are already approaching us. And telling us about their experience, what they are doing in many cases, using similar approaches to the ones that we hope to research.

**Sheri Spiegel:** Yeah. That's an excellent point. I'm excited to hear about our mailing list growing with a lot of producers on there interested in hearing about what we're doing. And graciously also agreeing to some interviews so we can learn more about their production approaches, their concerns about sustainability and maybe how research extension and education can help to address some of those. So speaking of sustainability, it's always such an interesting, um, thing to define. And so I know that for a lot of folks, it's kind of like a three legged stool where an, or even maybe a five legged awkward table with like different types of goals. So one might think about environmental goals, economic goals, social goals, like social cohesion, social wellbeing, human condition. And then another one. Might be something like, Oh, production. So we're looking at a lot of different things. I mean, sustainability can really comprise a lot of considerations. So do you feel like we're on the right track to address all of those multifaceted goals here with this project?

**Andres Cibils:** Yeah. So one important thing that this project plans to achieve is a, a trade offs analysis. And so the idea is to, since, you know, adopting some new technology or adopting a heritage breed to do your or cow calf operation. Or finishing steers on grass. Each of those influences each of the five aspects of sustainability that you just mentioned differently, and there are typically trade offs there. So one of the things that our team is planning to do is conduct an analysis of socioeconomic. Analysis, uh, environmental, of course. So ecological, of course, of the tradeoffs of applying each of these strategies that we'll be studying in the project.

**Sheri Spiegel:** I think that's pretty key because I think sometimes people talk about this triple win in when you're talking about sustainability in terms of three pillars. And it's kind of that idea that you can't have the triple win or it's hard to have everything or in our case, the quintuple win, you get, having everything in the same place at the same time. So really quantifying and articulating those trade offs, I think is going to be a pretty key part. And I know that those will go into the, also into the Western Beef Knowledge System, into the construction and structure of that.

**Andres Cibils:** Yes, absolutely. And so, so there, again, for the Western Beef Knowledge System, our analytical approach to studying the trade offs would probably be complemented with citizen science in the sense that producers will be able to tell us what works, what doesn't, what saves them time, what doesn't, what is marketable and what isn't. And so that'll contribute to our analysis of tradeoffs and I think will provide a good balanced estimate of the impact of what we're hoping to do on the future sus… or the current sustainability of beef production in our region.

**Sheri Spiegel:** Yeah. Well said I think a key group that the project is seeking to support are of course, producers and ranchers on the landscape. And then also the beef producers who are doing background and finishing in the Ogallala aquifer region. I know that some of our Climate Hub listeners might have a basic concern about cattle production at all, when it has to do with greenhouse gas emissions and other resource uses. And I just want to say to them that that is a key element of what we will be studying. Um, as far as greenhouse gas and water use footprints of different production systems. And so we will, we are recognizing some of those concerns. We're taking them into consideration as well.

**Andres Cibils:** Yeah, that's a, that's an excellent point.

I just wanted to add Sheri that we, we are collaborating with experts from the USDA ARS who one of whom has just completed a, sort of a nationwide analysis of the footprint of beef production in the United States. And so I think we are… Well, we are relying and have scientists in our team that are, uh, on the cutting edge of, of these sorts of assessments. And so definitely that puts us in good shape to do analyze these as a potential trade offs as well.

**Sheri Spiegel:** Yeah. So that'd be Dr. Alan Rotz’s, um, new paper, I believe in agricultural systems. Not too long ago. Yeah. And I think that there are also some pieces of ra… resilience of ranching on rangelands that also this project is exploring kind of some of the sort of social and ecological services that ranchers actually provide on the landscape, which might be also surprising for some listeners. Like one thing that keeps coming to my mind is how ranching as an infrastructure has maintained water sources for some endangered species that many care about and some, and just biodiversity in general. So there are, um, yeah, just some surprising sort of benefits that ranching can provide even in arid systems that can be sensitive to grazing. So I think that this project is well poised to look at the full scope of concerns and benefits of ranching and beef production.

**Andres Cibils:** Yes, yes, absolutely. And of course it provides for the livelihood. Both directly and indirectly of many, many people across the region. And so from the perspective of the social sustainability, uh, we are interested in understanding a little bit more about how the strategies that we are planning to research will improve the community folks surrounding beef production, but that are both involved directly or indirectly in some way or another.

**Sheri Spiegel:** Yeah. And I think research at the Jornada by Climate Hub scientists and some past scientists have shown really quite a major economic effects of ranching in the, in the region and the cascading effects. I think we can all see it, but it's also been quantified. Well, yeah, so this is, this is super interesting stuff I was going to, so as we're talking about Dr. Rotz, I was, I was also thinking about some of the other project collaborators. So I think we're really lucky to have folks from the Agricultural Research Service in Mandan, North Dakota, we have people who are affiliated with the Southern Plains yeah, Grazing Land Laboratory. Dr. Rotz is in the Upper Chesapeake area of the country, Upper Chesapeake Bay area of the country at the Pasture Lands Research Unit. And then we're really lucky to be working with Texas A&M as well. Who else do we have on the team?

**Andres Cibils:** So of course, through the five ranches that you mentioned earlier, we have both private ranchers and NGOs such as the Nature Conservancy as well. And we have affiliated sites internationally that are conducting studies to look at the ecological sustainability of using heritage breeds. So colleagues in Mexico, in Argentina, and very possibly in Uruguay as well, working with a local heritage cattle breeds and also setting up long term studies to look at the impacts on the landscape of grazing these breeds versus improved breeds. So, so yes, we have a really broad national and international network and and I, I don't want to forget our colleagues at Scotland's Rural College also and you will be, I think, hearing more from one of them and they have a leaders in application of, of precision farming in extensive livestock systems in the Highlands, and are collaborating with valuable collaborators of the projects as well.

**Sheri Spiegel:** Yeah. I feel like network collaborations are huge in this like those, um, those Agricultural Research Service units that I just named. I know the Jornada and NMSU became closely linked with them through the Longterm Agro-Ecosystem Research network or the LTAR network of 18 longterm research sites dedicated to advancing sustainable intensification of agriculture in the U.S. So, yes. I feel like network connections are really key to achieving our goals here for sustainability of beef production. Um, so this, so you're saying so Criollo, so I don't even know if we’ve named them yet, but so Criollo cattle, are the heritage breed that we're looking at, specifically Raramuri here in Southern New Mexico is what we're looking at. But I think there are Criollo all around the Americas.

**Andres Cibils:** Yes. Sure. So there are over 30 biotypes of Criollo cattle that basically descend from cattle that were brought to the Americas by the Spaniards, and that were we think from Southern Spain was genetic influence of Northern African cattle as well. So yes, our international collaborators are working with their local biotypes of Criollos and comparing those to improved breeds that are similar to those that we use in the U S. And one thing that I, I forgot to say besides the Criollos is that our network of collaborators, but the project in general will also provide incredible opportunities to train graduate students, postdoctoral research associates, who are, will be sort of key to the success of this project as well. And so that's happening in the U.S. But also happening in these other places, these other countries that are currently collaborating with us.

**Sheri Spiegel:** It’s wonderful. Yes. So as we close, do we want to just review some ways that listeners can learn more about our project? I was thinking we have a website, correct? swbeef.org. Um, we also are brand new in the Twittersphere, so people can follow us there and Tweet away.

**Andres Cibils:** Yes. And we, we will be putting out a quarterly newsletter. And so the newsletter will be available on the website, but also for folks that are interested, they can contact Sheri Spiegel or myself or anybody on the project. And we will be happy to sign you up and send you our quarterly newsletter.

**Sheri Spiegel:** Absolutely. And I just would like to close as your host and as a, an active participant in the Southwest Beef Coordinated Agricultural Project that we really value your feedback. So please do get in touch, let us know about your concerns and your hopes for sustainability in the Southwest and in Western ranching in general. And we look forward to hearing from you. So thank you, Dr. Andres Cibils. It's been a pleasure talking with you.

**Andres Cibils:** Thank you. You Dr. Spiegel, it's been a pleasure on my part too.

**Sheri Spiegel:** Yeah. Yes. It's all ours.

**Andres Cibils:** Thanks to the Climate Hub. For featuring our project on their podcast series.

**Sheri Spiegel:** Yeah. Keep up the good work climate hub and we're signing off.

**Sarah LeRoy:** Thanks for listening to Come rain or Shine podcast of the USDA Southwest climate hub and the DOI Southwest Climate Adaptation Science Center. If you liked this podcast, don't forget to subscribe, like, or follow for more great episodes. If you want more information, have any questions for the speakers or would like to offer feedback, please visits, climatehubs.usda.gov or swcasc.arizona.edu.

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