## Blooming Prairies: Native Forb Research

## Season 1, Episode 40

[Intro music]

**Kiernan Brandt:**

Welcome to Cattle HQ, a podcast from industry experts and progressive producers discussing cutting edge info about the cow calf sector to keep cattlemen and women in the know and positively affect their bottom line.

**Madison Kovarna:**

Welcome to Cattle HQ, brought to you by South Dakota State University Extension. I am Madison Kovarna, the beef nutrition field specialist based out of Watertown. Joining me on this episode is Kaylee Wheeler. Kaylee is a range field specialist with SDSU Extension, and has a deep passion for South Dakota range land and grazing livestock systems. She is based out of our peer regional center, and is joining me today to share some information about the importance of native plants, and a research project she is currently working on. Kaylee, I’m super happy that you decided to join me this morning to record this for our listeners, for them to dive further into what we’re doing on the university side, to provide them some information to improve their management and just food for thought. But with that, I’ll give you some time to introduce yourself to our listeners who aren’t as familiar with you, and anything you’d like to start off with.

**Kaylee Wheeler:**

Thanks, Madison. I’m really excited to be a part of Cattle HQ today. We’ve been working on kind of a cool project this summer with SDSU Extension and the South Dakota Grassland Coalition. So, it’s been a really fun summer. You said it, I am a range field specialist based out of the peer regional center, and really, I get my passion behind the rangeland and grazing livestock. So, I love working with producers on grazing projects, and just all of the education and good things that come out of our prairies.

**Madison Kovarna:**

Absolutely. And I think that’s the most important part of us being an extension, is the fact that we like to teach and we like to get that information out to people. I’m glad to work with people who think the same way as me when it comes to working with our producers, and giving them some information to use. But you already started discussing what this project is and what we’re looking at, could you give us a brief overview of what this project entails, the nuts and bolts of why we’re doing this or what’s going on with it?

Kaylee Wheeler:

Yes. So, what you said about working in extension and getting to work directly with producers, I think that’s really the key here, and that’s definitely something that drives my passion for this job, is that we have the ability to do research and do projects that directly go back to our producers, and help them with their management on their places. So, essentially, at its core, the goal of this research project that I’ve been working on this summer has been to collect native forbs across the state of South Dakota to help establish nutritional and mineral values of those plants. So, the idea behind that just stems from a need to really protect and take care of our native prairie habitats. Along with that, we know that plant diversity is incredibly valuable for our grassland ecosystems for many reasons related to just overall, resiliency of your operation and your pastures, soil health carbon capture, as well as our pollinators, but we’re at this point where we really don’t know much about the value of plant diversity just for our grazing livestock. So, contrary to popular belief, we know that cattle eat quite a bit of plants beyond just grass. So, that’s the idea at the core of what’s driving this collection of native plants across the state.

**Madison Kovarna:**

One question that I had is I know before I got involved with this project, I had never done much grazing stuff up until I started talking with you guys on the range side, but could you hint more on what you mean by when you say native forb? Is that a certain type of plant? Are there any characteristics that puts it into that category?

**Kaylee Wheeler:**

Yes, so kind of a general term. We call them forbs, but generally, it’s just a broad-leaf plant. So, generally, they are flowering. A lot of times, the flowers look different on the different plants. But when we talk about native forbs, we’re generally talking about our native wildflowers. So, the things that flower, the things that are not grass out on the landscape.

**Madison Kovarna:**

Got you. One other thing too with this project is you had mentioned at the beginning in the introduction that this an effort between not only SDSU Extension, but also the Grassland Coalition. Is there an origin story of why these two organizations came together to do this research? Was it something that either/or went looking for the other one to do? Can you give us an insight onto who’s involved in the management of this project and why?

**Kaylee Wheeler:**

So, this project is really unique. It’s very exciting because it’s really been planned from the beginning with a huge emphasis on our partnerships and producer involvement. So, when I say partnerships, I mean that we have a lot of major supporting partnership organizations. You and I, we work for SDSU Extension, but we do a lot of work with the South Dakota Grassland Coalition. Some of our partners are the Natural Resource Conservation Service or the NRCS, The Xerces Society for Invertebrates, the Nature Conservancy, Audubon Great Plains, Game, Fish, and Parks, and several others. I hope I’m not missing any, but the origin story is that the Xerces Society has been collecting plants across the Great Plains for a couple of years now, as well as Kevin Sedivec with his research team up at the North Dakota State University has also done some work with native forbs. We’ve been seeing what these guys have been doing just to explore the nutritional value of these plants and the benefits of them. So, we wanted to jump on that train and start gathering some data as well. So, the South Dakota Grassland Coalition with a grant from the NRCS service, started working with SDSU Extension, and then we involved these other partners to just do the planning behind the scenes to get ready for this project. It’s really cool because we’re all owners of the data. So, we’re all just helping each other out and sharing the data because we all want to help each other with our educational materials and stuff like that for our various audiences. But at the end of the day, I think all of us partners realize that it’s really important for us to be gathering data in South Dakota because that gives us the most localized and accurate data for our producers. The nutritional value and mineral content of our plants is really driven by soil type and soil contents, the minerals and stuff like that that are in the soil, that’s what ends up in your plants. So, here in South Dakota, we definitely have some unique soils and definitely have some high-selenium areas as well. So, all of the plants that we’re gathering across the state are being analyzed for protein, energy, and all of the minerals, including selenium. So, it’s been a really cool project so far, and all the partners that we’re working with have made it really great. The best thing is that all of this data we’re collecting is going to be available for all of our partners to do all of their educational programs, and anything they work with producers for, they’ll have access to this data.

**Madison Kovarna:**

That’s been my favorite part of this entire planning process, and even as we’ve been working this summer of collecting plants out in the set land areas that we’ve been sampling from. It’s just the fact that everybody on this relatively large team, when we start to pencil out everybody in all the organizations, and they’re respected employees and members, when we started to put together all of the work that we’ve all been doing, there are so many moving parts that it’s been really interesting for me to see how each organization brings something different to the table, but we’re all working towards the common goal of getting more of this information out to our producers. Because when we start to think of the nutritional value of some of these native plants that may be traditionally were targeted to be removed from a pasture, if our cattle, our sheep, or other livestock can utilize them for energy over these grazing months, why wouldn’t we want that information, right?

**Kaylee Wheeler:**

Yes.

**Madison Kovarna:**

That’s the one thing too that South Dakota is famous for, is our range lands. A lot of the times when people come to visit us here in the range land prairie state of South Dakota, they want to come out and they want to look at those places. But for the people who live here and manage this land, what is the importance of understanding how to manage this rangeland or these native grasslands that this project can assist with?

**Kaylee Wheeler:**

Rangelands are a big thing in South Dakota. Generally, when people think of what a rangeland or a grassland or a prairie is, they just think about vast areas of grass. While that isn’t not true, sometimes we forget about the complexities of what our prairies really are. So, generally, they’re home to thousands of species, of grasses, forbs, shrubs, insects, wildlife, and livestock. If you start to think about just like the diverse landscape of South Dakota, even as you go from east to west, we have the Black Hills, the Badlands, the West River Prairie, the Tall Grass Prairie, all of those things that are inside of South Dakota and you start to put together the pieces of all of those places and it’s a whole lot more than just grass. Another common misconception is that cattle only eat grass. In fact, we generally suspect that up to a third of a cow’s diet on average can be made up of plants that are not grass. Those are going to be plants such as forbs and shrubs. So, as I said, the forbs are like our broad-leaf plants. They typically flower. Our shrubs are going to be more of those woody bushes, and cattle will eat those as well. So, those two thoughts that I introduced, is that the majority of folks probably think that prairies are, or should be mainly grass, and that cows only eat grass. So, when people see plants that are not grass in their pastures, their natural instinct is to just control those plants by chemically spraying or herbicide or things like that, or like you said, removing those plants whether they’re pulling them – whatever they’re doing. I’m not here to talk about good plants and bad plants on the prairie because I want to acknowledge that I know that we have noxious weeds that do require control. However, it’s important that we start recognizing a lot of our native forbs can be really beneficial for cattle nutritionally, and plant diversity benefits for other reasons. I hear reports all the time of cattle eating certain plants, we just don’t know anything about the nutritional value of those plants. So yes, I think it’s just this idea about our grasslands are more than just grass. Our prairie ecosystems are just so diverse, and they are meant to be that way.

**Madison Kovarna:**

That’s been the most interesting thing for me when we go boots on the ground, out into these land areas that we’re sampling from, is if you drive by the same pasture that we could be sampling in, if you see us out there, you’re probably only going to see those tall grass species that we’re walking through, and wonder, “What are those hooligans doing out there? It’s just grass.” But from our view of being in that pasture, being on that rangeland and looking down, there are so many species that you can see in a well-maintained pasture, whether it’s those native forbs, whether it’s just shorter species of grass versus the taller ones. And it’s really unique to go out and see how east pastures has it’s own population too. That’s been super fun for me. You mentioned too that our livestock, a third of their diet can come from – especially cattle, can come from these other plants other than grass. One of the cool things that I always like to mention for our producers is that there are times of the year that our cattle will go over to a thistle plant and eat those red buds right off the thistle plant, which to us seems like a pretty unenjoyable experience. I know I’ve been on the wrong end of the thistle one too many times. But I’ve always found it really cool that our cattle can utilize those things and the intuitively know when that time is to eat those things. I don’t know if you had anything you wanted to add to that thought.

**Kaylee Wheeler:**

Yes. I mean, its this whole idea of cattle eat more than grass. It’s sometimes mind blowing, like there are things that we have been trained to say that cattle don’t eat those things and that they’re not very desirable plants on the rangeland, but actually, boots on the ground, observing cattle on the landscape, you’ll be shocked at some of the things that cattle eat. For example, this summer, there’s been a couple of instances where I’ve observed cattle eating curlycup gumweed, which is a plant that is kind of waxy and sticky, and it’s not something that cattle – that we normally would say cattle would eat, but then, you observe cattle being put into a new pasture and they are going to that first. I’ve also seen the thistle example. Horses have been known to do that as well, eating the buds of thistles. Another big one is yucca. A lot of people don’t think that cattle will eat yucca or that you’re starving them out if you force them to eat yucca, but I’ve observed cattle eating the leaves of yucca pretty frequently, especially in the wintertime when it’s the only green thing out there. So yes, cattle, I think, given the opportunity to expand their palate, I think sometimes you’d be surprised what kind of things that they’ll eat. And I’ve heard a lot of testimonials from producers across the state of cattle eating things that I never would’ve suspected. So, that brings up the idea of other ruminants as well. Sheep and goats, they do not eat as high as a percentage of grass in their diet, and they can actually be used to your advantage to graze more of those forbs and shrubs species as well.

**Madison Kovarna:**

I have always loved the analogy that cattle will eat like a picky toddler if you let them. If we allow them to go back to that intuitive grazing behavior, it’s amazing what they’ll pick during certain times of the year versus others, how plants are more favorable during some times, and it’s almost like the cattle just know when that is. That’s something I think we can really use moving forward in our management strategies, is just working more with the cattle rather than working against them, or having them do things that maybe necessarily aren’t most advantageous to a healthy prairie system.

**Kaylee Wheeler:**

You bring up a really good point about working against your systems versus with your systems. I really just think that that is going to be a key strategy moving forward in our production in the coming years, is just learning how to work with the things that you have, learning how to work with mother nature, learning how to work with your cattle, and with your landscape. All of those concepts.

**Madison Kovarna:**

In your previous examples, speaking through what cattle will eat outside of their normal, you mentioned a lot of different species. In this project, I know you have a set list. I believe there’s about 27 species on there. Obviously, the plants that we’re targeting – can you give us some insight on how that list was made, maybe some specifications that these plants had to meet, or maybe even the land that we chose to find these plants on had to meet as well?

**Kaylee Wheeler:**

Yes. I will say it was tough coming up with the list because there’s thousands of species out there, and everybody’s got different ones that they’re interested in, but we ended up coming up with a list of about 30 native perennial species. Like I emphasized at the beginning, this project has been planned from the beginning with an emphasis on our partnership organizations and producer involvement. So, we all got together, people made lists that they were interested in. and we took everybody’s input to put this list together. So, your question about criteria, the criteria that we used was that it had to be a native species to South Dakota and it had to be perennial. Meaning, that it returns every year, it’s not an annual that seeds out and dies. Then, we looked at forbs and a couple of shrubs. So, we took into consideration what producers from the board of the Grassland Coalition wanted, as well as what’s already been collected by the Xerces Society. I mentioned that they’ve been doing a couple years of collections across the Great Plains. So, North Dakota, South Dakota, Nebraska, and Kansas, they already had some samples. We don’t want to double dip and collect the same species that they already had. So, that’s how we came up with our list. We really wanted our data to add value to the data that’s already out there so we can combine our data with the Xerces data, and hopefully, have an even stronger data set. You asked about specifications, I will say some of the ones that we are collecting in great abundance would be purple cone flower, western snowberry, cudweed, sagewort, leadplant, purple prairie clover. As you mentioned, the thistles, we’re collecting some flodman and wavy leaf thistle, American licorice, milkweed, silverleaf scurfpea, some of those things.

**Madison Kovarna:**

Out of the big list, I know you just gave us a quick run-through of some of the big hitters, but is there any specie of these native plants that you’re most interested to see what comes back on these nutrient profiles after we send them in? Is there anything that gets you super excited to see what’s going to come out of it?

**Kaylee Wheeler:**

Yes, I would say that some of our more shrubby species, like western snowberry or buckbrush as some people know it, as well as leadplant and yucca. We’ve been collecting samples of all three of those, and those are ones that seem to get a bad rep on the landscape sometimes just because they are a little bit woodier, they’re persistent, and it seems like cattle don’t graze those as much. So, I’ve been really excited to dig into those types of things. Because if cattle are grazing some of those new green shoots of the year, maybe they’re not grazing the woody parts of those plants but maybe they’re grazing the succulent new growth, that just really interests me. I also would say I’m really interested in some of our more lagoon-type species. So, the prairie clovers, and the licorice, and some of those things as well.

**Madison Kovarna:**

I was never a range kid. Growing up, I always were like, “I like the cattle, I don’t like the plant side of things.” But thankfully, as I’ve matured and gone through schooling and just been out on the landscape with different producers, different herds, and different areas of the state, I’ve definitely started to gain an appreciation for all of these different plants that we have. I’m excited just to simply see what is out there, especially on the beef nutrition side of things. We’re venturing into this world of customized mineral. But when we’re looking at that, are we only looking at what the grasses are providing, or we’re also looking at potentially, what other species are out there. I think that’s the most exciting for me that gets my engine going about this project is just simply having so much more information to base these management decisions off of because we’re only as good of managers as the information we have. I think this research is going to be astronomically important once we start putting all of this together towards the end of this project. At least for me, I think that’s what I think is getting me most excited.

**Kaylee Wheeler:**

Another thing I should mention is that we are collecting these plants throughout the grazing season. We’re trying to collect them at all the different growth points. So, when they’re just vegetative and when they are flowering, as well as after they produce seed. That just goes along with what you were just talking about, like the management implications. If we can see how the nutritional value of these plants changes throughout the year, maybe we have certain ones that are really high in protein early in the year, and maybe you have a pasture that has an abundance of that plant. So then, that right there is a potential application of maybe you graze that pasture first in June and maybe you don’t need to provide a protein supplementation while those cattle are grazing that plant. That’s just one example of how we could potentially use this information.

**Madison Kovarna:**

Absolutely. And I think that nicely wraps up what you had mentioned earlier of working with our landscapes versus against them. These landscapes weren’t put here for us to come through and try to make them better. Mother nature has this amazing ability to provide things for the livestock, for us, and I think if we start to work with that aspect of management and just the prairies in general, I think it’s cool to see how much stuff comes relatively easy to us. But with that, what can our producers get out of the results once they start coming out of this project? What’s the big why? What are you hoping that they’ll take away from these results once they start getting published and put out into the public for these other organizations to use, for them to use, and for us to use? What are you hoping that they’ll take home?

**Kaylee Wheeler:**

Well, yes. I’m really kind of nerding on about this project. I think if it hasn’t been apparent yet in this podcast, there are so many potential avenues for the information from this research to be applied. With all of the partnerships that we’re working with, everybody has unique audiences and I just think this is going to provide valuable information for our landowners, our livestock producers, and even landscapers and gardeners that maybe are in more urban areas. It’s going to keep continuing to contribute to research efforts into rangeland and grazing behavior, custom mineral - all of those things. Just this general idea of statewide improvements in our plant diversity, wildlife, pollinator habitats, soil health – all of those things. So yes, that’s my disclaimer, is I do think that this is going to be the start of something big, and there’s so many potential avenues for this very preliminary information that we’re getting, and I’m just excited to see people take it and run with it and do their own thing. But broadly, one of our goals is to directly help with education at the Grassland Coalition Grazing Schools, as well as improving our NRCS range and pasture tools, the educational side of things. But also, just certainly the main goal of the research is going to be providing information to producers and landowners about retaining native forbs on the landscape. With that, hopefully a reduction in the spraying of these “good plants” that we want to have in our landscape. But also, we’re going to be able to explore these for grazing nutrition. As you said, this opens the door towards the conversation of proper mineral nutrition and custom mineral mixes that could be based on your location and soil type. Another hot topic in my mind would be the incorporation of multispecies grazing on an operation. We talked about the differences in diet percentages based on the different plant types, grasses, forbs, and shrubs. So, cattle eat about two-thirds grass and one-third forbs. Sheep and goats, it’s a lot less grass than that. So, they’re going to eat a lot more of those forbs and shrubs. Goats eat a lot more shrubs. Sheep eat a lot more forb. In fact, the old rule of thumb is that you can run one ewe behind one cow and not have to decrease your stocking rate. Of course, that only works if you actually have the forbs and shrubs available for those animals to graze, but it’s definitely something to explore just for the purposes of adding another enterprise to your operation and just diversifying. Also, we hit on it throughout this episode, but just the idea of working with the landscape. That’s something that really hits home with me, is just this idea of reconnecting to the land and understanding the whole prairie system. Even if a cow doesn’t eat a certain plant, it doesn’t mean that that plant has no purpose. Every insect, every plant, and every animal has a role to play in the system, and I just think it’s really important to start paying attention to those things. As we move towards the future and more and more of our prairie gets converted to farm ground or urban sprawl and we’re losing prairie to woody encroachment from the Eastern red cedar and things like that, I just think now more than ever, it’s just so important that we’re taking care of our land, protecting plant diversity, and really just prioritizing balance and resilient systems.

**Madison Kovarna:**

Absolutely. I agree with everything you just said. I think you really hit the nail on the head there with all of those thoughts of what could potentially come out of this project. One thing that I’m excited for once the results start coming out of this project, is bringing the spotlight to these plants and having people go out into these landscapes and finding these plants. I know that’s fun for me now that I know what species look like, and I’m starting to dive more into that plant identification world of what those plants look like, and being able to find them and showing other people how amazing our rangelands and prairies are simply with just how many species coexist out here of plants, insects, little tiny invertebrates. We’re talking all our reptiles and all those fun things out there, livestock, humans – everything, all has it’s place out there. I think it’s super cool to just get out there and see how they’re all working together. We are closing up on the end of our time together which definitely bums me out. This conversation has been really fun for me to have. But Kaylee, I’ll give you the floor if you have any closing comments before we leave this episode, and hopefully, our viewers definitely had as much fun as we have. Do you have any closing thoughts for this conversation?

**Kaylee Wheeler:**

Yes. Really, just I want to say thank you to all the partners that have been involved in this research. Thank you to all the producers that have helped us collect these plants. It’s been a very fun summer out in the field, getting to – as you said, just boots on ground, getting to learn more about these plants and getting to see them out on the landscape. I am getting very excited to just dive into this data that we’ve been collecting and just making plans moving forward.

**Madison Kovarna:**

Well, with that, I want to thank you, Kaylee, for joining me on this podcast. The information you’re going to gather from this project is going to benefit not only cattle producers, but we mentioned earlier, our smaller ruminants, our sheep, our goats, and I think all livestock producers and land managers greatly. The conversation today already mentioned it, has challenged my mind in thinking outside the box. It really gets me excited to start thinking about rangelands in a different lens than maybe traditionally we’ve looked at them. The next time you’ll join me, we’ll be discussing more about the results that have come out from this project. We’ll also bring someone from the Xerces Society who has done the lead-up work to this. So, I’m excited to have you both come back to discuss what’s come out of this and how we can apply that. But with that, this has been Cattle HQ brought to you by SDSU Extension, headquarters for all things beef cattle. Visit extension.sdstate.edu for the latest beef information. Until next episode, stay curious and keep learning.

**Kiernan Brandt:**

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[Outro music]