VIRTUAL VENCE FOR CATTLE HERD MANAGEMENT

Featuring Anna Shadbolt

Research Associate, Colorado State AgNext

& Andy Lawrence, Fourth-Generation Producer

DJ May 00:03
Welcome to the Decode 6 Podcast where we take your questions about carbon and ecosystem services and match them to the experts with the answers. I'm your host, DJ May. Now here's today's big question. What is virtual fence? And how could producers use it? To answer that question? We have two guests this week, Anna Shadbolt, and Andy Lawrence. Anna is a research associate at Colorado State University's AgNext, where she has been working with Andy, the fourth generation rancher in Colorado to try out virtual fence on his land. They'll tell us all about virtual fence and what it's really like to test out a new technology on working land. Anna, Andy, welcome. It's great to have you here.

Anna Shadbolt 00:48
Thank you. Thanks, DJ, good to hear from you. I guess it is not see you.

DJ May 00:52
Yeah, no, good to hear from you, too. I'm really glad you could be here. So and I'm gonna put you on the spot. First, tell us what is virtual fence?

Anna Shadbolt 01:00
Yeah, so virtual fence. It's basically this concept that originates I kind of I compare it to like dog collars, is that you can set up a Invisible Fence anywhere that you want. So you put a collar on your cattle, and then that collar communicates to a base station. And you can create fences anywhere you want from your computer, from your computer, it goes to a satellite, the satellite to the base station base station to the caller. And then these animals are basically equipped with the invisible fences. The way that they're like responding to these invisible fences is through sound and shock. So they'll hear a beep as they approach these invisible sentences. And then eventually, they'll have a shock on the collar. But yeah, and so you basically just need like the coverage from the base station. And you can pretty much put a fence line up anywhere within bounds. But for the most part, that's kind of how it works. Cool. Well, tell me

DJ May 01:57
a little bit more about the particulars of that. So can it be any size? Is there a limit? What are your restrictions you're working with?

Anna Shadbolt 02:06
Yeah, so, um, the size, it kind of varies, and we've been testing this a little bit. But Vence, which is a company that we're using there, several other companies doesn't recommend going any smaller than 50 acres on your virtual fence lines, this is kind of more of an animal welfare issue is you don't want your animals hitting those boundaries all the time, you want them to be able to get away from the stimulus. So if you go too much smaller than that, you run into the risk of them just constantly being hit on these boundaries. So that's one of the limitations on the virtual fences. We've found that you have to kind of work with animal behavior. So don't you know we've had to an Andy has been really great about this is like putting your virtual fence line on top of a hill, you know, where your cattle aren't really going to be pushing anyways, things like that, and really working within the animal behavior in their movements. Um, but as far as like the coloring goes, we have them on 120 cows with their calves. And then I also am helping with 120 steers on a different project. But yeah, so as far as the collars go, you can put them on pretty much anything.

DJ May 03:18
Okay, cool. And is it just the cows that have the collars? You don't have them on the calves? Right? Correct. Yep.

Anna Shadbolt 03:23
It's just the cows. And the calves just kind of stay with their mamas. And

DJ May 03:29
yeah, okay. So the concept is great. What, what are the potential uses? Like, how do you see this working out on working land?

Anna Shadbolt 03:37
Yeah, yeah. So um, one of my personal big focuses with virtual fence is like the sustainability aspect of it, and being able to keep your animals in or out of specific areas. So one of the things that we tried about a month ago, is putting exclosures on a riparian area. So you know, this looks like you go walk your riparian area, and maybe see some areas that are washed out or a little degraded. And you can actually exclude that area without putting up any fence lines or anything like that. And you can do it for a small period of time, a long period of time, and keep your cattle out of that area. Or vice versa. If you have an area that's really overgrown, or somewhere that you actually want your cattle to be, you can put them in that area. So I think from like a sustainability standpoint, it's really interesting to be able to manage your herd in a very pastoralist way from your computer. It's almost like you're bridging these gaps of like a very traditional and historical kind of management with this very high tech technology. So yeah, that's one of the ways I've really been inspired. But Andy, do you have anything to add to that from a producer standpoint?

Andy Lawrence 04:48
No. net net net much do I mean, it ventually I think we'll come to a point where you can use it for quick rotation deal and kind of rotate some cattle through due to an error similar, like she's talking about where you're not getting grades now, but right now it's not it's not the concept is ton of there, but the way of doing it's not quite understand that I guess yet are still learning about that part.

DJ May 05:15
Now that's a great segue. So tell me, Anna, Andy, how did you to start working together? And I guess, Andy, tell us about your operation, like how you thought maybe events would fit in?

Andy Lawrence 05:26
Uh, well, I'm a fourth generation rancher here on this place. And with Forest Service grazing permit. And I guess one of the scientists up at the USDA Experiment Station, which is next door to us here was talking about this, and I just kind of at a meeting, and I suggested that maybe that would be something that would be fun for me as a joke, kind of a deal. And he took me serious, which he always hit works out. Anyway, long story short, we came up with the idea, give this a try. And I was the lead person on this and got a hold of me and two other scientists and so forth. And so we've we've kind of work together. I know, since the spring kind of getting trying to get it organized, and, and working through some glitches this summer. I think it'd be if we did again, another year, I think we will have learned some things that that we can know how to get around a little better, maybe for next year.

Anna Shadbolt 06:30
I agree with that, that it has been a little bit of a learning process. Yeah, yeah.

DJ May 06:36
No, that's great. I want to know more about that. So you mentioned you have what was it? 120 cows with the collars on right now. Right? It talked me through the setup. What was it like to get them on collared? What does it been like to manage them with virtual fence? How does that look on the ground?

Andy Lawrence 06:52
Well, I guess if I'll step in on this, it turned into a little bit more than I thought it was going to eventually, when we first started talking about this, we ended up having to gather the cows, I have some kind of I have a system that I use in the springtime, as we're getting ready to go to, to our summer pastures, and the cattle are not very close to home here. So we had to bring the cows home, split the calves off of them, and then run the cows through the chute individually, of course, and then put the collars on, it took quite a while it, you know, and if people get all this done to kind of keep it flowing. And it was a little exciting, I guess the cows, when we first did this, the cows jumped in joy. They were really scared of the collars, it really affected their, their manner, I guess because they they really fought it for a little bit for Oh 3045 seconds or a minute or so. And then they kind of they kind of cooled down. So it just it wasn't the the color wasn't doing anything to him. He's just hanging on their neck, but it just interfered with, you know, they're what they're used to. And so that was kind of an exciting thing he kind of had watch your back that we want him didn't turn around and went over he is she's running from the collar and those sorts of things. And so that part of it was kind of a process and a little bit more of a process than I had originally thought it might be. I think in another year, we might try to set up cows a little closer to home as we get into that deal. And then we had to go through a training process. They wanted them in a smaller pasture, most of my pastures are from one to two section pastures. And so we had to put them in a smaller pasture, which I have a couple of those. And then Anna was able to set the virtual fence up, kind of shrink in the pasture. After a day or two, we kind of did that over what a week period, I guess to kind of get the cows the idea of of, you know how the fence would work. So we we went to the summer pastures and read redid those, they kind of had an idea what was going to happen to him. So that was a that was a little bit more of a process also there than I, you know, originally I thought it was something we kind of just it kind of just it would develop real quickly and you something you could you could do you know in a day or two and it's not it takes quite a little planning and then like say it took us you know, a day day or two, handling the cows quite a bit more than we normally do that time of year. And that sort of things.

Anna Shadbolt 09:34
Yeah. And then to add to that, so we work off four different base stations, three of them are on the Central Plains Experimental Range and then one is on the Pawnee grasslands and our allotment which is what Andy is using. And to put those four up, it took me about two days with events technician. So there's you know, that setup and then yeah, just to kind of echo what Andy's saying is it is kind of an undertaking, and I think that there is is a way to probably plan and manage it so that it works with your operation, you know, but um, yeah, like, like we said, there's a lot of learning going on. So like, if you were really going to implement this into your practice, I think there'd be a way to figure out how to do more, you know, to get multiple jobs done at one time and color your cattle and you know, but yeah, getting it off the ground initially was kind of a big effort. So,

DJ May 10:27
yeah, I want to I want to backtrack and talk about the equipment a little bit. So how big are the collars?

Anna Shadbolt 10:34
They're about three by six, I would say, the actual box, and then there's two chains that come up on them. That's actually where the shock is distributed is on the chains, and then a breakaway chain at the top. Okay.

Andy Lawrence 10:50

So it's a plastic looking box that holds the GPS apparatus and battery and all that stuff in it. And it's, it's probably an inch and a half thick, I suppose. Also, it it's not real heavy, but you know, I mean, it's a little bit, it's more weight than what they're used to having around their neck. So it was kind of a shock to their system for, you know, like, say, for 30 or 45 seconds or so. We just green colored a few yesterday. Some of the colors are falling off, which is sorry about that, too. Yeah. And I think that's a little bit later in the conversation here. But anyway, we recovered the cows yesterday. And they didn't it didn't even affect them. I mean, they were just, they just walked out of the squeeze chute just like normal, like, okay, it was just the initial shock was kind of initial coloring. They're like what is on me? Yeah.

Anna Shadbolt 11:44
And then they figure it out pretty quick. But man, and it's very visceral, and it's very exciting. Every animal I've seen, collared has done pretty much the same thing where they're, you know, bucking and running and stuff. And then about 30 seconds, and they're like, Okay, the kind of give up, so,

DJ May 12:01
okay, yeah, well, you know, can you blame them? I mean,

Anna Shadbolt 12:05
I would be upset, too. You.

DJ May 12:08
Yeah. Okay. So that's the collar. And then you mentioned, there's a battery, I kind of want to talk through cost just a little bit, too.

Anna Shadbolt 12:14
Yeah. So to kind of give you the full picture, each base station costs $10,000. And then it's 12,500 with install. So that's your main cost, if you are going to implement this, like your base stations is really what's going to like be the bulk of your costs. And then each color, and this may have changed. This is what it was almost a year ago. But each color is $35. And then each battery is $10. So I did just recently have to buy some new batteries. And two, because some of the collars had died. So we just needed a new round of batteries. But the collars are rented. So we will give those back at the end of the year. And then if we do do it next year, we'll get the latest model to us. So the rental system, I personally think it's a really good system, because you're not stuck with a bunch of old collars. You're constantly getting the newest product that you can. And so yeah, yeah. So we'll box them up and send them back here once we're done with them. And yeah, that's kind of all the costs outside of labor and that aspect of it. But

DJ May 13:26
yeah, is there any software you have to use with this?

Anna Shadbolt 13:29
So it's a website, and it's called herd manager. I know that they are working on like an app, but that has not been established yet. So it is just a website. And you just log into it. And you can share branches you can share, you know, farms. So like, I can see like a whole, like 20,000 acres that we're managing. But yeah, yeah, that's the man I'm sorry.

DJ May 13:53

Okay. So, you know, say you, and I want to go in and change the boundaries. You do that through the website. Correct? Yeah. Okay. And then I think you mentioned there was like a waiting period, how long in advance do you have to do that make changes.

Anna Shadbolt 14:07
So this is something that we've run into, that's kind of a hurdle and like a mental hurdle more than anything. But it depends on your coverage, right. So we actually have pretty impressive coverage. But if you're getting to like really, Canyon areas, really hilly areas, it's real flat out here. I'm usually the tallest thing in the prairie. And so we have really good coverage, but it takes anywhere from 12 to I would say 36 hours for all the cattle to get synchronized on that, that new map you will that new boundary. So you know, like in the instance that Andy wants to move his cows because they're sick or something's going on, you know it, it's not like you can just do it really fast because you have to take that that virtual fence down. So something the Andy come up with is like blocking out your gates before so you have an escape route. Have you want to think about like, Okay, if I need to do something different than what we're currently doing? What does that look like? Because it does take a little while to get them. synchronized.

DJ May 15:11
Okay. And now gates, you make virtual gates and your virtual fence.

Anna Shadbolt 15:16
Okay, yeah. So when you make your virtual fence, you can click on specific points. And it'll take the virtual fence down in those areas. So you know, like gates, water, those are the main two ones that we've been using. But essentially, that would be like a break in your virtual fence boundary. So it would be up in other places, but down in that area, if that makes sense.

Andy Lawrence 15:39
So in our interest, just just what she's talking about, what we've done is, the pastures that I'm using have already been divided by electric regular electric fence. And what we've done is use the the virtual fence on the outside boundaries. And so where my my gates are, now she leaves that open so that the virtual fence doesn't go through those gates. So we can use those as gates. Now, if you're doing this in a in an open pasture without any outside fences, then that would be a little bit more of a problem. Something that that needs to be kind of looked at worked out somehow a way that we can adjust it so that you can open and close the fence quickly to get livestock in and out or whatever you're trying to do. In our in our case, it's alright, because we're backed up with the other electric fences. Gates already. So yeah, so that kind of fills in that gap for us.

Anna Shadbolt 16:39
And I can send you some screenshots of this, if that would help. Because it is kind of hard to visualize, like, what the website looks like, and stuff like that. So yeah, I can send you kind of some of the second, bring it up on my children's?

DJ May 16:52
Yeah, no, we can include that. For sure. I'll put that with the show notes, so folks can see it. Yeah. And here's, here's my silly follow up question, why not just take the collars off the cows, if you really need to get them out of a fenced or events in area.

Andy Lawrence 17:07
Cows in general, you gotta, you gotta be able to get to them. You know, I mean, most of my cows, you can you can be within, you know, four or five feet. But you're, my arms aren't that long enough. And not that quick.

Yeah. And you have to, you have to be able to cut the tying tying mechanism, which we're using, this is a cable, a small cable. So you'd have to be well cut that with a pair of cutters to pull the chain loose, or there is a breakaway system, but it takes more than just what a human can pull. So if that's not a practical thing, I mean, it would be impossible really to do it

Anna Shadbolt 17:47
maybe in like a dairy system, you know, or like something where these animals are really, really gentle. And you're in like a smaller area. But right now, like the pasture that we're using is six, it's a full section over actually 640 acres. And we have them virtually fenced into about 420 right now. So you know, it's like about 95 had heard in 400 acres. And yeah, yeah, so it's just,

Andy Lawrence 18:14
it never fails, the one that you got to move is probably the gentlest one you've got.

18:20
Yeah. And then, as far as like, the collaring, too, is, you know, we're putting these collars on, so they don't fall off. And so, like when we put them on, we'll test it to see if we can like pull it over their ears. And we've kind of come up with like, the rule for me is under their throat, like three fingers from the bridge, like from the box and their throat. And then if you can get over one ear, but not both, is kind of our rule right now. What we've found out is that a lot of different, they're all shaped differently. So like some of them have some short horns or a really big pole or, you know, like some animals are better suited for virtual fence, collars, and others. But yeah, so that's kind of another aspect of the collaring part is adapting it to each animal.

DJ May 19:11
Okay. All right. So once you have a collar, do you have the base station setup? You're all tricked out with your your new virtual fence, how do you train them to stay in those boundaries?

Anna Shadbolt 19:22
Yeah, so this is it's a four day training period. And it's the Vert the events protocol is what we used and it worked really well. So the first day you have just the shock on a hard fence. So you need a pretty small area of acreage and then hard fences as well so that they're hitting those boundaries and associating the hard fence with a shock. So that first day is just shock. Then the second day you add a really big sound barrier, and then the shock and then you change your boundaries. The next day for day three. And then on the fourth day, you'll put a boundary in the middle of the pasture so that they're hitting that invisible boundary instead of the hard fence boundary. And that fourth day is really when you can see if your cattle have learned or not. And for all the cattle that I've put through the training period, they learn on their good by the end of the fourth day, they've figured out the whole mechanism, which is pretty impressive. And then for Andy's, we actually did kind of an extended training period, just because of like he mentioned earlier the movements of where they were. So we put them into a bigger pasture, and kind of extended that same method and like cutting it in half to make sure they're still hitting that invisible. Fence Boundary. Okay, invisible. Yeah.

Andy Lawrence 20:46
So what the thing does is a cow gets close to the, the virtual fence, it'll start beeping at them, it'll make a beeping sound. And it's, I don't know, they're what, two, three seconds apart, or four or five seconds apart or something like that each beep. And then as she gets closer to the fence, the beep gets a little louder. And then if she does get to the virtual fence area, then it it gives her a little shock. And it's more of a tickle and a shock. I mean, you don't want to sound inhumane by saying it's a shock because it's, it's more of a tickle. I've seen them react to it. And they're kind of you know, shaking their head and kicking it their, their ear, you know, but

and then they just walk away a little bit and then it quits and then they just back grazing or whatever. So, okay, but they'll they'll know when they're getting close, because it makes a little beeping sound. And, in fact, the reason I know this, I was moving some cows one day and, and for some reason, we don't know why. But in the middle of the pasture, that electronic part of the fence started working. And the cows, I couldn't move them because they were they were, you know, being shocked by the fence and and they couldn't back up for some reason it encircled him. And we had to just stop and wait for probably five minutes and let them kind of stand and then pretty late, and we don't know why the fence did this. But then also, he went back to its proper locations and and then the cows just went on about their grazing just like they were supposed to be. But it was kind of funny. I was I was following along behind him and all sudden they started all beeping. Couldn't figure out, what in the world?

Anna Shadbolt 22:21
Yeah, there is a movement mechanism to so that I think it's three meters Every second is what it moves on, there is a way to configure it to change that. But that's kind of just like the automated one. And we haven't tried it with the cows. I'm a little nervous too, with the calves as well, because it feels like it might be a little confusing for everyone. But I think that there'd have to be like an additional and different training method for the movement vents. Because like, they understand the heart vents, but then to just throw the movement vents at them, I think it's too far of a leap, but that they can learn that movement events, if you're out there to maybe guide them the first few times, then you could maybe utilize that movement events, but

DJ May 23:08
Okay, so this is like the events would move ahead of them by like three meters every second, that's kind of so

Anna Shadbolt 23:13
technically behind them, I guess it depends on how you're looking at it. Okay. And then with that being said to, you know, you have to look at your animal behavior. So like, I would move on, you know, like towards water during their regular grazing hours, like don't do it when they're going to lay down and be sleeping or ruminating. But that is something we haven't tried. And like I said, I think it could be a little stressful with your fine, stressful with the calves not being collared, you know, and then maybe falling behind and things like that. But that would also I think, have to be kind of like a training element as well. Okay. So yeah,

Andy Lawrence 23:53
yeah. Would it be kind of like a, like, somebody herding cows, but you'd use the fence to hurt him with it? Yeah, I don't know how it would work. We we've thought about trying it on a deal. But it's not really, we haven't found a place that we can use it, you had to really experiment with it. They also said that it's been taught that, that you could make a you could move cows with an alleyway kind of a deal, put a fence virtual fence on each side, for you know, like a mile or two or whatever you wanted to do, so that they would get in this lane, and then they just drift along with the lane and they wouldn't get off either side. And we thought about experimenting with that. And we might use that later this this fall when we start moving pairs around the tween and stuff like that. We might try some of that stuff just just for an experiment to see if it does work or how it would work. But there's some interesting things that maybe can be used in this thing that we just haven't quite figured out the places that we can use yet.

DJ May 25:00
Okay, you guys are gonna have to keep me posted. And when will you try that?

Anna Shadbolt 25:05

No, we are only like halfway in at this point because they got collared June 4. Um, so yeah, we've really just had June and July. And June was kind of a trial months, I would say no, I was when their training period was they weren't in there like, established pasture. Yeah, you know, they went out on June 4, they were called earlier and yeah,

Andy Lawrence 25:27
they were called into the last, what the last week May is when we collar. Yeah, I think that the thing we found with it is, my cows have been running in this particular summer allotment for all their lives. We've had this allotment for since 1940. So every cow is has lived her whole entire life in this lot and and they know where all the water holes are, and where their favorite grazing spots are, and where their favorite place for getting away from the flies or whatever. And so, to interrupt that with this virtual fence has been kind of a, a little bit of a process, we've got some cows that have just ignored the fence and kind of went through. And I think that's caused, once they do that, and it gets kind of a heartbreak after a while they all go. We're slowly seeming like we're slowly kind of getting around that I think they're learning it more as the as the summer goes along. Also, I have five pastors I rotate through so every month, we're moving them to a new pasture. And so we're having a, we're having to learn how we want to divide it and block their their normal path, too. So it's kind of been a, we're learning as well as the cows are. And I think if you had livestock that was going to the new pasture that was unfamiliar with, I think it would work a whole lot quicker. And then what we found that, that the our process has gone through, it's turned into more of a process than I think most people think it probably would, would do. And I think that has to do, as I say with the cows and the knowledge of the lay of the land where they're at now.

Anna Shadbolt 27:19
Yeah, I would agree with that. I think it'll be interesting if we do do it next year, to see if they remember, like us and this method, you know, because yeah, actually the pasture that we're in right now, we just tried to cross section it. So there was like an east side and the west side. And they did not care about being on the east side. They wanted to be on the west side. And then finally, it was just like, Okay, fine, like go be on the west side. So we've, you know, pushed up that rotation that we had created a couple of days. But they go where they want to go and especially like there's been some, like thunderstorms. If there's a thunderstorm, they'll blow right through it. So yeah, I think that there's definitely some variables into the environment that influence things.

DJ May 28:07
Okay, so your two full months in what what has worked well, like have you seen anything that makes you think like, yeah, I want to keep doing this.

Anna Shadbolt 28:16
i They are responding to it. Yeah,

Andy Lawrence 28:18
they they've, we get we get some juicy juice out of it. I think right now and we haven't this next the next pastor, we go to hear what next week, I think it will be easier to pastor to try to divide just because of the lay of the land on on it. And I think so we'll we'll probably try to do some more smaller areas there in that pasture just to see how that works. And and that gave us another answer what whether the the cows are actually being affected by the collars or, or just kind of the heck with it and going on. But that I think this next one will we'll be able to do a little bit more. It's a little different kind of lay in the pasture. And so it gives us a better opportunity maybe.

Anna Shadbolt 29:11

Okay, and it has one of these, sorry, but like the more I use it, the more it's like oh well we could maybe do like I am getting more ideas as we're doing it. So yeah, to be announced to is like what we learn from this.

DJ May 29:27
What kind of ideas are you getting Anna? What is it sparking for you?

Anna Shadbolt 29:31
Um, yeah, so Well, Andy brought up a really good one yesterday is like using it to lean essentially. And to keep the cattle kind of as a reinforcement away from the calves when you do eventually, like wean them. I also think that this concept of you know, people that have really big pastures we're talking like five 8000 acres, and rounding those pastures up is is huge undertaking that if you could create virtual fences that just pull them In like day by day almost, to have them all gathered fairly close. So that if you're any branding on the pasture or something like that, you could do it that way. Yeah, now you put me on the spot. So I'm kind of drying. Yeah,

Andy Lawrence 30:15
well, we had an idea. And we tried it the other day, and it didn't work. But we needed to bring the cows, it's a three mile trip from where they are now to a set of trails to recall are the ones that that we needed to take care of. And so we attempted to divide the whole the cattle up on the upper end of it closer, so cut down some of that. And I don't know that we didn't get the fencing quick enough, or the cows didn't give a damn about the fence. One way or the other, it didn't work like it was supposed to. But I think that's something that, you know, that if, if we do it again, which I think we might try, we get a little ahead of it maybe a day or two in advance. Instead, it was something we kind of did overnight, you know, this recurring thing was kind of a, something we've been putting off and trying to figure out how we were not going to have to trail the cows too far to get it done. And, and finally, it came to the point where we just had to get it done. And so overnight, we came up with these ideas that, that maybe if we had some time to plan them a little longer, I think maybe it might have worked a little better. So we'll try some of those things again, I think, yeah. And then that's the winning thing, we we win here at home, and our cow cows are about, oh, half three quarters of a mile away. And, and lots of times when he first wean that cow just tear the fence down and come home. And so I came up with the idea. And this all depends if our batteries are going to be strong enough by that period of time, because we're getting kind of close on, on the length of the battery terminal termination, I guess. But if we think it's going to work due, we're going to try it on the on the weaning and see if we can hold the cows back off the fence, it only takes two or three days in between. But those first two or three days ago, we did this fixed fence. And so we might, we might try this this virtual fence thing. But like I say it's, we're going to be close on our battery dates. And is going to try maybe some adjustments, I guess there's a way to less. Frequent frequent, yeah,

Anna Shadbolt 32:28
like GPS pings

Andy Lawrence 32:29
right

Anna Shadbolt 32:29
now we have it set for five minutes, every five minutes, it updates through location, which is just for research purposes, really. But producer, like if you were using this in an actual setting, not that you're not, I'm the research part. But um, that you would do, you know, 30 minutes to an hour, you really don't need to be seeing your animals every five minutes. So that's something that can extend your battery life. This isn't so public lands, I think are actually a really interesting case for virtual fence. And like BLM Forest Service, this is a Forest Service allotment, but you run into, you know, labor, keeping up fence boundary lines and that type of

stuff. So what's cool is that you can know where your cattle art or art for that matter, that you know, if they are getting onto the neighbors, you know where they are, or, like that type of situation is you can really create fence lines really quickly. For like that purpose, which I think has an interesting take. And then you know, maybe it looks like the base station is provided by the organization. And then the producer buys the colors or you know, something like that. Whereas I'm running Nebraska, and we have had a bunch of Blizzards this winter. And so cattle were just everywhere. And that was kind of an interesting thing that came up with my family is it was like what you could figure out where your cattle are. But yeah,

Andy Lawrence 34:02
That was the one thing that I thought about originally was was with the Forest Service there once in a while they come up with an idea to have us stay out of a certain area and allotment or so forth. And so I originally when when they started talking about this, I thought it was something that maybe we could work with the Forest Service on to virtually finish the cows off. Well, as it turns out, I think it would take more of a process than what were we have the time to do. It's something that's got to be planned, like I say, you know, a little advance to put the collars on and all that stuff. So you couldn't really do it. But that was the original thought I had working. Now the Forest Service is saying that that's possibility and they're doing they're doing their own study, kind of following what we're doing in the mountains to the west of us. Had forest fires here a few years ago and burned all the fences down and so they actually just eliminated those allotments. They're not We've been using them. So they have thought about that if the ranchers are interested up there, maybe coloring cows and doing that with the virtual fence up there and being able to reuse some of those allotments that they've they've eliminated. There are certain people that are happy that we're not using those helmets and you know, and that's one thing, but but the Forest Service would like to graze them if they could, but it's too expensive to go up there and fence that. So that's, they're looking at our experiment here and seeing if it's something that that making me maybe use and do up there and in the mountains, I'm not sure if it would work because of the seagull needing to get around up and down the hills and through the trees and all that kind of stuff. I don't know how. We're not having much trouble with that. But I think there's a possibility that that would be a concern up up there for those guys.

DJ May 35:57
Okay. Okay. I have one last question. Maybe, I usually make a liar out of myself with that.

Andy Lawrence 36:06
Always leave yourself a little room.

DJ May 36:07
I know, I should add a little more wiggle room. Andy, could you have done this without the research component?

Andy Lawrence 36:13
I wouldn't have done it. I don't think Yeah, first of all, after, especially when I know what I know now. And no, I would I couldn't have done it. The expense would have been too much for me to put, you know, into the cows and expect the cows to pay for it. Just just for the fun fun thing of doing this, I think you know, yeah. It wouldn't work in my pocketbook, I guess is what I'm saying. Unfortunately, I have to make a living somehow.

DJ May 36:44
Well, Anna, you kind of mentioned the idea of like cost sharing, maybe you're having the base station setup by somebody else. Do you think that's a more feasible way to do this moving forward? If people wanted to try it out?

Anna Shadbolt 36:55
I do. Yeah, well, and realistically, so like, to put it in perspective, the four base stations that we have are covering this, our allotment, and then the Central Plains Experimental Range. And that's roughly 20,000 acres. But the coverage from these four stations is like 40 to 50,000 acres. Like, it really goes farther than that. So like, hypothetically, if you had other producers in this area that these base stations are covering, like, why wouldn't you offer that to them, you know, and then we're kind of like, as a cooperative or an organization. And, you know, even if it was just like neighbors to neighbors going in on a couple, you know, like, it wouldn't even have to be like an official organization per se. But if it was something that like your ranching community was interested in, you could like go in with people. And I think that that'd be a lot smarter way to do it or not smarter, maybe, but like feasible way to do it. Because like each person doesn't really need their own base station. In my experience, and that could be different once you get into different terrain and stuff like that, but especially out here in these prairie lands. Yeah, yeah. So yeah, like that type of thing. And then I also think that we're going to start seeing a lot more initiatives type things and like people doing, you know, a cost share with like, organizations, conservation organizations, that type of thing. Just to help get this off the ground.

DJ May 38:32
Yeah. Perfect. Okay, I did lie, I have one more kind of a lightning round question. In like, just a couple of sentences. What advice would the two of you give to somebody who's like, I'm going to try virtual fence?

Andy Lawrence 38:47
Be patient. So biggest thing I have? Yeah, it's something that you can't, you can't do overnight, you got to plan out. So you need to have a little patience with it, to plan it out, and so forth.

Anna Shadbolt 38:59
And yeah, I guess my biggest piece of advice is, like, maybe have a plan before you even do it, you know, because that's like, something and like, I kind of view this on this as like our pilot year, you know, what I mean? We're like getting our ducks in order, and like, really utilize, you know, experiencing this. But if you had like a reason to have virtual events, I think that that would be crucial to like your success, if that makes sense. Is that like, this is what I want to do with virtual events. And this is how I'm going to do it. But yeah, yeah. And then also, I think that there's this concept that it's like, easy, breezy, you know, and that you're gonna put a bunch of collars on your cattle and you're gonna have no fence lines, and you're gonna have no hired men anymore because you don't need, you know, labor. That's not at all kind of what's happening. I think that you could eventually get there, but especially like in the first, you know, parts of it, it's it is a lift to get going. And we've

Andy Lawrence 39:58
also found that that To You know, you can't go by the GPS. So you can't sit here and look on your computer and say, Well, my cows or wherever that because they're not sometimes the the GPS signals not telling the caller where they actually are or they're not telling the call or whatever. So we've we found lots of things that, and I think it's something that's got to be gone through with the company that they'll work out eventually, but, but it's you still got to be out there spinning usual time, you know, you can't live by this thing only, there is a place for the virtual fence. I'm not sure that in our particular area, our particular system that that there is a reason to really use it. Other than just a very small, like she said, with the riparian areas and those sort of things once in a while, but, you know, to go through all the trouble of color, and I'm just for a two day thing and keep them off of a certain riparian area, it's not really not really worth it in my system. There are systems where I think it is definitely worth it, and would be where that we get all these glitches. And I think we're coming up with I'm sorry, I'm taking too long talking about, we're coming up with more things that we're seeing now that, that I don't think the company has even thought about. And the only way you can do that is through an

experiment like we're doing. And if she's a real nice girl talks really nice to me, we'll do it again next year, but we'll probably do it but but, you know, it's things that like this, we're able to pass the word on to the company and saying, Man, you know, these things are not working like they're supposed to be or, or we've got these kinds of problems in order to make this thing work. Like you say, it's gonna have to, you got to do something different. And so we're, you know, we've lost several callers that, and now we're going to have to go hunt for those callers. Because we don't know where they are. We're assuming that that and we've tried this, we had a couple of words, she took the GPS coordinates, and we drove right to the, to the X point, and the caller is not there. So apparently, the it didn't update at the right time. So that we can see in a full section pasture, those cows are all over the place. So you're going to have to, you know, kind of wander around. So that's some things that that's got to be worked out. How do we find those those collars? How do we keep those collars from falling off? Those sorts of things. And the only way you can do that is through an experiment like we're doing and, you know, I mean, it's and it's been a learning curve for both of us even, you know, just trying to figure out how we can best utilize this thing to get experiments out of it and get the cows to understand that what we're doing is best for them. I've, I've went through and in no 1214 years ago and and divided this allotment into five different section pastors are roughly section pastors working with the Forest Service, kind of how we both thought the pastor should be laid out. So so the pastor's are pretty well, in the best position and shapes they can be. So the virtual part of it is not really anything that I need to really do different. But it is interesting that we're you know, to try to, to adjust the, the movement of the cattle a little bit,

Anna Shadbolt 43:21
I will say that this year has been extremely kind to us with rain as well. So, you know, we haven't really had to worry a ton about water and forage either. So you know, maybe in a different year, we would have entirely different answers to which is something that I'm kind of like last year, for instance, like, maybe we would have been rotating them like really, really, really into like, you know, really fast, narrow rotations. But now there's so much for it to that doesn't even really matter, because it's like they couldn't possibly eat as much grasses as out there. Yeah. So you know, and there's also you know, like that point, is it like maybe certain times certain years, certain seasons are better than others? And yeah, yeah, so yeah, we've been very lucky this year in that effect.

DJ May 44:13
Yeah, well, I just the troubleshooting you two are doing alone, it's gotta be worth a ton to whoever does this next. I mean,

Anna Shadbolt 44:21
yeah, yeah, I do when we started this. Um, I don't know that I felt like events expert, but at this point, I'm like, I feel like an expert.

DJ May 44:30
You found it. Oh, my gosh, Anna. Yeah. I can't believe

Anna Shadbolt 44:33
Yeah. Yeah. So yeah, but um, no, it's been good. And it's been fun tonight. Yeah, I think that also, this technology is like very on the cusp. But you know, that like, once things become more affordable and more broader, I guess is the word I would use is there's more companies doing more things like that, that it will expand really quickly. Yeah. So yeah, maybe next year we'll have a totally different system and we won't even use base stations. Who knows As you know,

Andy Lawrence 45:00

well, the thing I was thinking to is, instead of the callers if we had a tag, we could put in their ears something, you know, could match up with your, your ID tags, something that you're already done, you know, you could use that. And you wouldn't have to gather the cows to put the collars on and, and to do all that stuff at something that your system would already be going in. And then you could just take it in and run with it. And then we could utilize it in in more ways, like I was saying, where you could, you know, fence out a little area overnight, you could do whatever. And so there's some technology, things that I think can be changed somehow, and I'm a lot smarter person than what I am. I guarantee that but, but some things that would be, you know, more useful to livestock producer and handier for the livestock producer to use in an open range situation, like what we're using in that would be much more economical for the guy to use. So there's some things that that to be worked out that I think will get worked out sometimes. Yeah.

Anna Shadbolt 46:07
And there's a lot of different companies right now, you know, there's no fence, there's no color, I think is the name of it. We're using just vents. And I really liked them. They've been a great company, but um, you know, like, no offense uses the solar panel, so they don't have the battery. There's a lot of iterations of this. And I think that as more iterations come up, it'll get narrowed down to like the best product.

DJ May 46:30
Yeah, yeah. Well, thank you both. For the work you're doing on this. I'm gonna have to catch up with you. If you do it again next year. Figure out what you what you learned.

Andy Lawrence 46:39
We'll send you an invitation.

DJ May 46:41
Yeah, I'll come check it out. Yeah. I would love to

Anna Shadbolt 46:45
Collaring is the end of May. If you want to come back.

DJ May 46:48
It's not too far of a drive. We could do it. Yeah. That'd be great. Um, well, I'll just wrap it up. Thank you both so much for being here today. And for talking about this. I think it's an awesome area to explore. It was really nice to hear about it.

Anna Shadbolt 47:00
Yeah. Thank you. I appreciate you reaching out, ya know, yeah, this has been great.

DJ May 47:07
Anna Shadbolt, is a research associate at Colorado State University's ag next program. Before joining ag next, Anna earned a degree in Human Dimensions and natural resources from Colorado State and worked as a research technician for the USDA Agricultural Research Service on the Central Plains Experimental Range and is no stranger to cattle. She grew up in the sand hills of Nebraska on to fifth generation ranches. Now she's serving as ag next grazing management outreach and research coordinator. Our second guest, Andy Lawrence is a fourth generation rancher in Colorado. He lives and works on the grasslands and strives to better his own land and cattle herd with proper range management. Andy values continuous learning by being actively involved with ongoing studies and range land groups. You can learn more about ag next in the research that folks like Anna and Andy are doing by checking out the show notes. In fact, you'll see some of

those screenshots that Anna mentioned of the software they're using to run events. If you liked this episode, please help us out and subscribe. Heck, if you really like it, share it with someone else, you know who might like it too. And if you have questions about new technology, carbon markets or anything to do with agricultural ecosystem services, come visit us at decode six.org We have lots more and we'll see you there.