## Making Waves in Pasture Water Systems (Part 2): Pete Bauman,

## Wayne Vincent

## Season 1, Episode 51

[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 back to Cattle HQ. I am Madison Kovarna, a Beef Nutrition Field Specialist with SDSU Extension. In the last episode, I talked with Wayne Vincent from Common Sense Solar and my co-worker Pete Bauman, a Wildlife and Natural Resources Field Specialist. As promised, this episode contains the second half of the conversation that we had regarding alternative water sources. I hope you’ll enjoy the second episode and we’ll jump right in.

**Pete Bauman:**

Let’s talk about systems management and let’s start with the pond. Let’s start with like, “Okay, I’ve got a cattle on a dam. I want to use to the first best right thing to get a cattle out of the dam.” Now, the progression of pumps, you touched on this a little bit earlier. We’ve had some pumps we’ve played with early on 10, 15 years ago that did the job in the time that they’ve advanced, but let’s talk about the why. So, Wayne, when you’re setting up a system on a pond and I’m going to let you in, I think I know the answer but where do we want to pull water from in that pond? Let’s start with that. It's shallow versus deep. Which is better and where in the water column did we want to try to pull our water from if we want to actually maximize our very best water quality?

**Wayne Vincent:**

I always like to get middle to lower. It could be cooler water. It can be out of the algae belt most times but I’m going to jump in there real quick, Pete.

**Pete Bauman:**

Yes.

**Wayne Vincent:**

Probably, I don’t think I’ve ever touched about this yet but when we started this out, we started out who were so crew for some of the systems we had. They’re like a floating built pump and they pump a ton of water. Remember those ones?

**Pete Bauman:**

Yes, absolutely.

**Wayne Vincent:**

Now, we ended up getting into these clean submersibles in this water because it gave us more control. We have a control, we have a flow switch, and we could actually pump more water that way. The problem, the issue that we saw, that myself and others in my fields saw are, was those suspended solids. The tolerance is on these submersible pumps. They’re meant to be in the well creation. That’s the water they meant to pump.

**Pete Bauman:**

Right, clean water. [Laughter]

**Wayne Vincent:**

It’s clean and screened. There would be a few instances here and there where you just see some excessive wear on the pump just because of the solids going through, or the mineral going through it. So, to talk about the certain manufacturer that I do most of my development with, they developed a line of service water pumps with better tolerances, more open tolerances, probably a lot better flow. The only thing that sits in the water is a piece of inch and a half suction tube and a foot valve. So I have that much less stuff in the water, so that if it does go dry, I’m not going to buy and pump on them in and it gives me that much more range to pump on. I could be a lot more effective with the water I have. That’s been one of the innovations that has changed it for me.

**Pete Bauman:**

That’s great. Are those pumps like this new generation like that? Are they self-priming them?

**Wayne Vincent:**

No, you prime them once. You prime them once. It’s not that big of a deal. I already tell my guys I usually do a 50 or 75 feet of inch and a half. I will put a camlock on one end and a camlock on the other. Just fill up before you leave.

**Pete Bauman:**

Right.

**Wayne Vincent:**

Fill up the home with the hose. Good projects for the kids. [Laughter] Get all the water in that, right? Then a quart of water just to top everything off and it’ll go. We have sensors on it where, if it ever loses its prime, it’s not going to run.

**Pete Bauman:**

Yes.

**Wayne Vincent:**

The pump will save itself.

**Pete Bauman:**

I really wanted to bring that up. That’s weird. I want to say we’re an area of more but it does seem like maybe there’s more awareness, but blue-green algaes and surface algaes, they’re always a question, and as Madison suggested, we can’t do biological testing. We can do minerals and solids, and suspended solids, and give you an idea of what that – you know, basically, it’s electrical connectivity that we’re really testing on how much is in the water. But the biological testing, if you come in with a really, really dirty water source and it’s full of algae, it really goes back to what Madison said earlier. It’s a common sense like, “Would you want to drink it?” and once you ask that question, then it kind of opens people’s eyes. It’s like, “Wow. Maybe I could do better.”

**Madison Kovarna:**

I know that there’s labs. I know for sure. I believe NDSU does it who actually said if a blue-green algae bloom was a concern, we can send them up there to test but a lot of the times, you will see that problem long before…

**Pete Bauman:**

You get a result.

**Madison Kovarna:**

Yes, and you’ll kind of see these – you might not see a bloom but you’ll see that if that might be an issue that you’ll come up with in your system long before a bloom might actually happen.

**Pete Bauman:**

That’s where the common sense is, is that you can validate those suspicions but my goodness, you’re coming to me and I see that, I’m like, “You need to move the cattle now. We don’t want you to wait through a blue-green algae bloom test to validate your dead livestock.” We need to be really proactive in that and so, how do we avoid all that? You can actually pump from some of those. I mean, it’s all circumstantial. It’s all one off. However, pulling water from the mid to lower column mitigates a lot of those worries and of course then you just step up with rural water or well water. I have a whole bunch of tidbits I’d like to pique Wayne’s brain about here on systems management, but I want to start with the big picture thing first, Wayne. We don’t have to go real deep into this but I’m wondering where we’re at in the conversation with rural water systems. Right now, we’ve got a lot of herds on rural water systems that, really, 10-15 years ago we didn’t. These systems, I would say they’re at capacity but they’re definitely - rural water systems are now providing water to municipalities more than they used to. These herds, I did some math, more or less in average size herd can use up about two million gallons a year. It’s two million gallons a lot. What is the context of moving water out of rural water systems? So, what are you starting to hear or see in the world of tapping into the rural water? Is there anything that’s emerging or changing or is everybody still pretty comfortable with these herds going on in rural water systems?

**Wayne Vincent:**

Rural water, from what I’ve seen in the last, let’s go for this, through the five-year trend here, getting a tap for anything other than domestic household use sometimes is an issue, sometimes it isn’t. It depends on the area and who the provider is and what’s the infrastructure availability is, because they have to have reserve, they can’t tap into that, and that’s kind of the starting point. A lot of it is - rural water was, they may have put it in 15 years ago, but they bought more land. So, you want to extend that and that works okay as long as it’s the same cattle. We’re not increasing the herd; we’re just increasing new ground because some of them will not mature on gallons. I’d be interested to see what comparison is between the small cattle herd and a four-person household.

**Pete Bauman:**

Yes. I think I’m not going to say those numbers because in my mind…

**Wayne Vincent:**

I don’t really know. That’s why I’m asking.

**Pete Bauman:**

I did some comparison. You say two million and it sounds like a lot. It’s a pittance compared to a town. Whereas a dairy, let’s say a 12,000-head dairy operation, is going to use as much water as a 5,000-person town in a daily average, something like that. I’m not comfortable putting those numbers on the table, but I think what I am trying to get at is don’t assume, ask. Do your research ahead of time to see if your rural water system will provide and has the capacity and then the other side, other than all the nutritional stuff with rural water is that there’s pros and cons to every decision. What you gain in the rural, let’s say if you are working with NRCS, for instance, and you’re entering into an EQIP program or any number of programs where a water system is supported and with those systems, they want to make sure that there’s a slight overbuild and storage. The reason people really gravitate to rural water is because it automatically meets your storage capacity needs. You don’t have to over tank. You don’t have to double your tanks because you’ve got a really positive reliable source. So, there’s a money savings there on the infrastructural investment and I guess I just want to bring that up because it’s ask first, right?

**Wayne Vincent:**

I will always ask first. There’s a lot research to do that produce this to do before they shut on one thing. Reach out to NRCS, reach out to the Extension office, say “Here’s what I like to do. What are my options?” That’s a great way to start a conversation because they’ll steer you in the right direction. Thinking about the extension and NRCS is these people like doing their job. They’re happy to do it. They’re a great source for you. The other side of it is, I mean, you talk about rural water. One great thing about rural water is consistency. You have consistent quality of water. The chemical balance is always very consistent. The pressure and flow are usually consistent. The temperature is going to be consistent. There’s a lot of consistencies there but that consistency have an expense tied to it that how is that going to pan out five years from now to tell them that there’s a correction per head. When you have dams that maybe they were fenced out from the cattle would be an alternate source of water for maybe less, I don’t know. That’s why I’m asking you as a producer. You need to figure that out. Everyone’s expanded and rural water is consistent and that’s one of the beauties of it.

**Pete Bauman:**

That’s great.

**Madison Kovarna:**

Yes. During grad school, I was an assistant manager at our cow/calf facility just right on the edge of Brookings. I believe that we were either on the city or rural water kind of same system. But, when we were running to build a facility, we had to go and ask, because one of the things we really needed if we want to do research was to ensure that we weren’t going to be having compounding effects come in due to water quality. We needed to make sure we had highly consistent water quality for these projects to happen without having to then potentially make those results faulty because we couldn’t confirm nor deny what water quality was. So we talked to them and they actually put, I believe, a six or eight inch main going to the main property so that we could then individually pipe off to do all of our rotational grazing paddocks. They all have Ritchie fountains. We have eight electronic watering systems at our [[Unintelligible]](https://recordings.civi.com/cgi-bin/player.php?file=CHQ%20-EP%2051.mp3&starttime=677&duration=20), and we’ve got Ritchies in all of our dry lot pens. That was a big thing to work out with them to make sure they could provide us with enough in pressure, in quality, and all those things, but inadvertently, it’s an expense that was worth it, not only because we have our research things going on but just the consistency of making sure those cows were getting a consistent product coming out of those tanks was worth it on our end for that. I think if rural water doesn’t work or it’s something that you just can’t stomach the build to get them to put a bigger main to supply the amount of water that you need, that’s fine but making sure that the water that you’re willing to use does have a similar consistency. One day, it’s not going to produce something that’s the best water you’ve ever seen, and then the next day, it’s pumping sand at the bottom of the pond, kind of thing.

**Pete Bauman:**

One of the things that I am, and we’re going to get a little nerdy here with some water facts and figures but it’s a really important stuff for people to understand. One of the things I did, I think I ran these numbers, I don’t know, five, 10 years ago. I don’t remember. Sometime here in the last reasonable bit. So, the numbers are probably still relatively accurate. I’d looked at the rates for I think six rural water systems. I just was curious. You take an average herd of 200 cows, whatever, you look at your rate. I came up with an average of about $0.12 a day to water a cow/calf pair as an actual cost over summer. I’m like, “Who wouldn’t invest to $0.12 a day?” That’s not that bad. It’s an expense but it’s only about a 5% to 10% of what we might invest in yardage fees, right? Then when you put in that context, that’s a say because you just told us you get that 10% back in gain. So, I don’t know. It’s an interesting thing.

**Madison Kovarna:**

Yes. It’s something that, when you start putting your numbers together and really looking, like Wayne said, asking and doing your research and really figuring out what options you’re willing to explore and the price tag you’re willing to put on investing in your infrastructure that will impact your production goals. I think that, if you were to get anything out of this episode, I hope it’s the fact that you understand that it’s doing your research and asking the questions, and talking to people across organizations, across different companies to just get more familiar with the pros and cons of any structure, any development, anything like that.

**Wayne Vincent:**

Whole agreement. It goes back to ask those questions. Talk to rural water. Through everyone I’ve ever dealt with, they know their numbers. They know their availability on volume. They know the pressure on every line. All these guys you see driving around in the Webb water pickups and then with Dakota pickups. They’re geniuses. They’re experts on their section. They know exactly where the water’s at and what’s available. Just call in and say, “This is what I want to do but we have capacity and what’s this going to cost me?”

**Pete Bauman:**

They like sharing that knowledge too. That’s their wheelhouse.

**Wayne Vincent:**

They do.

**Pete Bauman:**

They’re good at it.

**Wayne Vincent:**

They’re very good at it.

**Pete Bauman:**

Okay. I’ve got some nerdy things, Wayne, but I mean this is important.

**Wayne Vincent:**

I’m sure you’ll do that - you do nerdy really well. [Laughter] There we go.

**Pete Bauman:**

Let’s just pick your brain a little bit. Let’s share things with your thoughts on overland distances, air expansion in lines, pressures, et cetera. Let’s talk about overland pipe. We’ve got black pipe going over the ground, sometimes at some pretty extensive distances, and we get things like friction loss and air. So, tell me, share with us, generally - bring us into Wayne’s world a little bit on all that stuff on design.

**Wayne Vincent:**

If we’re going to have an overland pipeline, why can’t we plow it at two feet?

**Pete Bauman:**

I didn’t ask you that question yet. That was the next question. [Laughter]

**Wayne Vincent:**

All right.

**Pete Bauman:**

Let’s say you’ve got an existing system and you’re happy with it and whenever, or you’re thinking about building and you’re not plowing in. What are some of the considerations on distance expansion, pressures? How do you handle that conversation?

Wayne Vincent: Number one, you’re going to have to move with the pump or gravity. They’re your two best friends. Friction loss, anybody can calculate that out for you; I can do it, NRCS can do it, you can do it for somebody coming in, and we’ll make it work. Rule of thumb is that everybody thinks: one is, you’ve got to solve their problem; and one is, it usually doesn’t help a bit. Minimally, you will be at the inch and a quarter to inch and a half, and if we’re dealing with the gravity system, I’ll use for example, the system in OpenSummit that I got done this year. Eight thousand feet of pipe were coming from a dam atop the hill to a 3,000-gallon storage tank whatever flying out of that the six watering areas so we can move those cattle where they wash here and that was all two inch. Just two inches, the friction loss in two is, I mean, it flows. It’s lower pressure but it flows. That’s the beauty of it.

**Pete Bauman:**

How about draining, freezing, those types of things for overland systems. Everybody’s got their own theories. Let’s hear what’s actually truthful like what does work for us?

**Wayne Vincent:**

It’s dam one, using the right pipe. I think we’ve been down this slope before.

**Pete Bauman:**

We have. Yes.

**Wayne Vincent:**

Internally size and external size control. The pipes that we’re using on these, you don’t use any. There’s no metal fittings, there’s no insert. All that stuff is outside the amber control, there’s a 200 PSI pipe in minimum. We suck at fusion, electronic wrote our plastic fittings on. There’s no way if you think about an overland pipe, it freezes because you did catch it, then you go on the spring what’s popped? The hose clamps normally. So, that’s all about fittings on there and that works well. The other side of that is there’s always going to be a low spot. We’ll just put a little stub-out drain on it. You don’t have to drain the entire line. You just have to drain enough to get enough room for expansion because if it freezes and it’s on the surface, you don’t have any water out, that will – I’ll use for freezing the shape for that pipe and the diameter and move down to pipe. So, you got it. You give it a room.

**Pete Bauman:**

Yes, that 200 PSI high density pipe engines, correct me if I’m wrong. I always recommend trying to drain it out but I also would acknowledge that you can’t get away with - we know we can dry by within reason on some smaller equipment. We know that we can’t let it freeze but am I right in sharing this that, when you go at low pressure pipe like your – and I’m not picking on it – let’s say you’re a big box store, low pressure, black pipe. Ice freezes first then expands. It doesn’t do both at the same time. So, that 200 PSI pipe will force the ice to not be able to expand in a diameter because the pipe is so strong that has to expand lengthwise, right?

**Wayne Vincent:**

Yes.

**Pete Bauman:**

Whereas a cheaper pipe, the ice wins to be more or less.

**Wayne Vincent:**

Cheaper pipe is going to give up the fight sooner.

**Pete Bauman:**

Yes.

**Wayne Vincent:**

Well, it’s probably another example that we again note to hear that system 2000 gallons storage. My question was first off, a storage tank on a hill, that’s eight, nine foot total, you’ve got to anchor and ballast it. My question to the manufacturer was can I leave some water in here over the winter for ballast? They said, “Sure. Leave it there full.” At least that’s what we get for 1,000 gallons of water waste. Yes, that works out really well. It’s great way because it’s going to up. I think it’s a 9% increase, or expand 9%? Does that sound quite right?

**Pete Bauman:**

Okay. I don’t know for sure.

**Wayne Vincent:**

I think it’s 9% don’t maybe sign the paper work for. I could be wrong.

**Pete Bauman:**

That’s why I called you the nerd. [Laughter]

**Wayne Vincent:**

Yes. [Laughter] But yes, that just seems right in my mind. I could be wrong against it. If I am, please call in and correct me. [Laughter]

**Pete Bauman:**

Now, let’s go to your shallow bury. Let’s talk about that a little bit. What are the pros and cons of the shallow bury, and does it mitigate freezing with the high – all management thing’s still the same. This kind of address –

**Wayne Vincent:**

I would agree. I mean, one thing that I dictated is like, this year, no, I wouldn’t help the whole lot because there’s little cold temps and we got no snow cover, right? So the frost is driven out already. If we get snow cover before, so I bought that pound in my hand.

**Madison Kovarna:**

No, you’re good.

**Wayne Vincent:**

I’ll pretend [[Unintelligible]](https://recordings.civi.com/cgi-bin/player.php?file=CHQ%20-EP%2051.mp3&starttime=1192&duration=20). If we can get that snow pack before, that snow pack is a great insulator. The benefits of getting that shallow bury in - because, before, it was always you run a surface pipe or you chance it in six feet. Just like, “We used to do that,” and I’m just like, “Gosh, that’s expensive.”

**Pete Bauman:**

Yes.

**Wayne Vincent:**

So, it’s like we just got this thing in our mind. Well, it was just a summer pasture and we have a way to drain it. We should be able to find a zone where you can get that downwards protected, especially if there’s like a [[Crosstalk]](https://recordings.civi.com/cgi-bin/player.php?file=CHQ%20-EP%2051.mp3&starttime=1223&duration=20).

**Pete Bauman:**

Grass [[rig]](https://recordings.civi.com/cgi-bin/player.php?file=CHQ%20-EP%2051.mp3&starttime=1223&duration=20). Right.

**Wayne Vincent:**

Or other issues, or somebody hosed it with primary implement, where we could protect this to a degree, but had not the expensive going all the way. And we found that we’ll shallow bury and we’ll probably plow it in a couple of feet, maybe two and a half feet, it depends on the ground. That, if it freezes, it’ll go far, that’s fine. If you go into that immediate zone around that four foot, we found - because we did burst some pipes there once to see, and we actually did freeze it, and it took forever for it to warm up.

**Pete Bauman:**

Yes, I never thought about that.

**Wayne Vincent:**

I mean you won’t start to thaw until the frost is gone now.

**Pete Bauman:**

Right, right.

**Wayne Vincent:**

Because you used to think about [[Unintelligible]](https://recordings.civi.com/cgi-bin/player.php?file=CHQ%20-EP%2051.mp3&starttime=1263&duration=20) frost in six feet, so when you’re putting in these, not [[Unintelligible]](https://recordings.civi.com/cgi-bin/player.php?file=CHQ%20-EP%2051.mp3&starttime=1269&duration=20), but anything geothermal to help you tank – you’re down seven to eight foot because you’re tapping geothermal. You’re below the frost. So for us, we found that getting it down at that two-foot tank gave us a temperature stability on the pipe. Because what we’ve seen happen is when the surface pipe but there’s a lot of elevation increases and decreases, you’re going to train there and there. You’ll get what’s called a fish moss in the pipe, it’ll just - basically in the trained air, we get a hole in it. Because hot black pipe, cool cold water moving in trained air is a perfect storm. What we found was plowing it in, getting it stabilized, you know two feet below the ground at that temperature zone, cooler air, the pipe doesn’t get hot, it’s cooler water going into the tank. That worked really well and the expense is much lower than trying to dig it at six.

**Pete Bauman:**

Right. I’ve run an overland system at home, and it’s a small operation, and it’s just enough to really annoy me, had I had to deal with - I wished it was shallow bury because I’ve done all of these things. Working it, driving on it, burn. So, I love the idea of shallow burying. I love the vibra plow idea because you don’t disturb much.

**Wayne Vincent:**

That’s the thing with the vibra plow that I really like versus the trencher because I’ve trenched before, and you’ve got a much smaller weed path.

**Pete Bauman:**

Yes.

**Wayne Vincent:**

Normally, if you’re going to trench, you’re going to go both sides and you’ve got to plow that back on, and you’ve got to let that trend settle. Quite a lot of times, if we just plow it, I’ll just drive over the plow mark. [[Unintelligible]](https://recordings.civi.com/cgi-bin/player.php?file=CHQ%20-EP%2051.mp3&starttime=1353&duration=20) probably helps there. I mean, it’s nothing you’re going to break a leg in. That’s the benefit of it, but the big thing is overland isn’t bad. Overland is a good start.

**Pete Bauman:**

Yes.

**Wayne Vincent:**

Because let’s face it. There are some places where you can’t plow. It’s not rocky, it’s a rock. Right? So, at that point, you really have to build it up and put the pipe in or you have to just find another way around. Maybe we just excavate at different distance. But, an overland system is great. If this is just due system we’re doing, we’re just trying to see what works and where we want it, do an overland for a year or two, then you might be out there that second summer being, “You know, I really wish that tank was over there because it’ll work a lot better and get the cattle move when I want them.” Fine. So we marked that spot out, move that tank over, we try it out. “Hey, yes, this is what I really had in mind.” Then we go back in and then plow it, and you might be in a couple of few fittings but we’re going to use a pipe again. But the big thing for protecting the pipe was I had a client. I didn’t do his system. He was running at rural water. So, you know that cold, cold water overland, up and down, he was going getting a ton of fish moss. So, we went in and we ended up taking all of his old pipe, cutting the bad spots out, moving all the good spots back in, and plowing the whole thing in for an inch and a quarter, and it’s worked much better.

**Pete Bauman:**

I love this.

**Wayne Vincent:**

And it also extends your grazing season. I mean, you’re not going to get down into that at two foot for quite a while.

**Pete Bauman:**

Right. That’s a good point. The welded pipe option is – you know, the fittings option are still great. They work really, really well. The welded options are better. I think we can say that, and there’s a mixing and matching that goes on there. You can be really innovative. I know people that rent, and they go down to their local rental store and get a big air compressor with good storage, and then you isolate sections in the system. You can build up an adaptor in minutes to hook up to a compressor to your piping because of the outside fittings, and blow the systems out. There’s just so many innovative, easy things as long as you can free think. My question then to you, what’s the most fun and interesting or innovative project you think you’ve worked on, or is that putting on the spot?

**Wayne Vincent:**

[Laughter] There’s a lot of them.

**Pete Bauman:**

Yes?

**Wayne Vincent:**

You know, a lot of times it’s more difficult for this to do, as you’re doing it, you’re like, “Oh man, I should have finished college. [Laughter] I should have been an investment banker because this isn’t a lot of fun.” But then when you get it done and you see that water getting where it needs to go, and you see it making a difference for your customer, definitely yes. That was fun. That’s worth it. You’re cold in November doing it, but then that December when you’re sitting in your warm office going back through it going, “Yes, that wasn’t bad.” Yes.

**Pete Bauman:**

I love what I think you’ve brought to our knowledge of the area is being able to let’s say value add an investment. Once you design a system, and then what I appreciate about Wayne is like, “Okay, maybe for a little more money, we can put this pump.” You’re buying a pump. We’re not going to buy 10 of them. We’re going to buy one or two, and we’re going to put them on trailers. We’re going to put that resource around and we’re going to make this system work for you 300 days out of the year versus 30 days, depending on your rotations. These are just investment strategies that I think really makes sense.

**Madison Kovarna:**

I guess as we near the end of our conversation, at least today, are there any closing thoughts, arguments, things that maybe, as we’ve been talking, you’ve thought about that you want to be that last send home message before we sign off?

**Wayne Vincent:**

I’ll go. Check out your resources. I know I’ve said it before. The extension office, NRCS, they’re great resources. They’re well-educated and they’ve all got field experience. They’ll tell you what’s going to work and not work. They’ll give you a baseline. To your idea, it sets a spark in your mind of what you want to do. They’ll take the step helping you down that path of saying, “This will work better than this will work. Or maybe this will work really well and that won’t work so well.” They have that knowledge. And as a resource, like I said, they like doing their job. There’s nobody in NRCS who’s doing field work who doesn’t like it, because if they did, you wouldn’t be doing it.

**Pete Bauman:**

I would say my rule of thumb, Wayne hit it on the head, but to take it one step further. A lot of people that are exploring their water, or maybe they’re new to the land, they’re new to that pasture, or they’re new. I think people need to slow down a little bit. I really like to see people manage their property for two years before I will suggest that they really get into now a new design. Learn what their livestock, how their system works because it’s so tempting to jump into, say, a cost share program, and then you look over your shoulder and you’re like, “Gosh, I wish I would’ve just done this a little different, or that a little different.” Because they hadn’t had enough time to learn the nuances of their system, their movements. Maybe their gates are in the wrong spot. So, I just really want people to slow down, really learn their system first, think about it strategically, because again, until the time you sit on the hill and think, “Oh gosh, I never thought about doing it this way.” And maybe if you’re in a program, it becomes too late to change because - and we have to realize that program dollars are partner dollars. You’re entering into a partnership, and that was your contracts and there’s rules. So, sometimes common sense after the fact is too late. So, I just really want people to seek out their resources, like Wayne said, slow down, build a team, and a few minds is going to get you further faster than maybe what you’re going to come up on your own. So, very similar.

**Madison Kovarna:**

I want to thank the both of you for joining me on this podcast. This realm of conversations is something that I am still learning a lot about. Just growing up in a very traditional cow/calf system, realizing that there’s different ways to do things that we’ve always done, and you don’t have to do it that way just because that’s how the people before you did it. There’s a reason why people like Wayne have a job. There’s a reason why me and Pete work in Extension to bring these resources to people. Yes, I definitely want to thank you both for joining me. I’ve had a fun time learning and exploring the options available, not only in alternative watering systems but all of the little side tracks that we went down in this conversation. It’s been interesting to hear how these systems are also being used in practice and, Wayne, how you’ve been working with producers to make these systems work in their operations. I hope our listeners will take advantage of the information you have both shared with us on our operations and really start to think about the why they do the things that they do.

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:**

Thank you for tuning into this episode of Cattle HQ. Brought to you by SDSU Extension, headquarters for all things beef. We invite you to visit extension.sdstate.edu for the latest beef information as well as subscribe to the show on Spotify. You will also find show notes and resources from today’s episode, until next time. Remember, success is not a goal, it’s a byproduct.

[Outro music]