

Intro 0:05

Hello and welcome to the extension experience podcast with your host Josh Bushong, Trent Milacek and Dana Zook. Here you'll find insights into Oklahoma agriculture from West area specialists employed by Oklahoma State University Extension. Their perspectives come from assisting county educators and producers in the areas of Agronomy, animal science and economics. Thank you for joining us.

Trent Milacek 0:33

Welcome back to another episode of the extension experience podcast. My name is Trent Milacek, Josh Bushong, and I'm Dana Zook. Josh today, I think we need to talk a little bit about winter forage small grain forage producing that. And to do that, we're going to talk about fertility, right. Some of the main talk of what we're going to do today.

Josh Bushong 0:54

It kind of goes hand in hand.

Trent Milacek 0:55

Yeah, I guess we don't have to talk just about forage. I think we're gonna talk a little bit about grain only prospects as well, but it all kind of goes hand in hand in the fall to talk about forage. So what's the kind of to get started along this path? What do I need to be doing right now? Either right before my drill rolls, or kind of some people probably already getting started or as I'm thinking about getting started planting wheat. But what's my first step to figure out what I need?

Josh Bushong 1:22

Probably the easiest, most economical thing you can ever do is get a good soil sample. I know people have heard that year after year after year, but we always get guys calling or coming by and talking to us asking how much they need to fertilize and we can't ever give an answer unless we have something to base it off of. So at least get in the routine, which I think \$10 would get you soil pH, nitrogen, phosphorus and potassium. That's always a good step. 10 bucks for a quarter section definitely gonna be economical. So you know if you're high or low on whatever. So that's always the first step. So we started looking at doing that now. Because in the season, typically, we always do that late summer, early fall, because the way that nutrient cycles are in the soil are kind of decomposed our previous crops harvest. And we're kind of in that neutral zone where we're not getting big fluctuations of tie up or immobilization. And so we're getting better understanding how we need to fertilize that small grain or wheat crop.

Trent Milacek 2:27

Yeah, I look and soil sampling, kind of like I do budgeting and record keeping, because a lot of people will ask, you know, what's a good soil sample and there's a lot of different ways you can do that all the way down to grid sampling and all the way up to your composite sample for 160 acres and I would encourage people just to don't record something you're not going to use. So if you're not going to utilize grid sampling, whether that's with lime application or something like that, if you don't have the equipment to do variable rate, that grid sampling probably isn't going to do you much good if you're looking at one prescription for the whole field, so that's where it kind of the composite gets you where you need to be, especially just in the big picture. If you haven't ever done it before, it's probably a good idea to start there.

Josh Bushong 3:09

Yeah at very least, and most of these guys, they know their own fields pretty well, especially if they farmed them their whole life. I know there's different sort of textures out there, you know, the red Hill versus the bottom. So sometimes we kind of get guys split up their own field because they know their field. Sometimes we look at the Soil Survey maps and we break it down that way. Grid samplings, like you said, correcting acidic soils with lime variable rate lime, that system has paid for itself very, very well for a lot of guys. So if you are knowing you have certain parts of your field that's going to be acidic, getting that grid sample, to know where to put that lime so you're not making high spots out there. It's been very beneficial, but at the very least that composite 15-20 soil samples over that area gives you good average

Dana Zook 3:59

stuff How often should you use soil sample Josh?

Josh Bushong 4:04

I mean, like I said for 10 bucks, it doesn't hurt to do it every year but they say for immobile nutrients like phosphorus and potassium, we're looking at, you know, perennial pastures and stuff like that every three years but when you're looking at crops, and introduced species where you're up in the, the, the yield goal on those forages, we're looking at nitrogen that really needs to happen every year.

Trent Milacek 4:29

And I mean, everybody knows that yields are highly variable, and that's pretty much the area where you're removing those nutrients is through the grain. Every truckload of wheat or sorghum or soybeans you haul off that field is a certain percentage phosphorus and nitrogen and potassium and micronutrients. So

Josh Bushong 4:47

anything you bought, whether it be grain, beef, hay bales, you're taking some off the field you're taking nutrients with

Trent Milacek 4:56

And again, we say nitrogen is highly variable given the day not nitrogen value can change. But like you said phosphorus and potassium tend to be a little more stable over time. But, again, if you pulled a 30 bushel wheat crop off two years ago, and you pulled a 60 bushel off last year, there's not really a great rule of thumb to tell you how much phosphorus to put down to replace that so you really have to test to figure that out.

Josh Bushong 5:20

And we've got some long term wheat fertility plots here at Lahoma West of Enid. And it's just a big swing on how much you fertilize and how much yield is because we've seen some years where not fertilizing and it all gets you a lot more than you think. Big swings from you know, 20 bushels to 80 bushels and doesn't factor in that previous crop at all.

Trent Milacek 5:41

Mm hmm. Yeah, well, we get we get nitrogen from rainfall and things like that. So like you said, and based on soil activity, soil microbe activity and things like that breaking down previous years organic matter all effects, what nutrients are available.

Josh Bushong 5:57

That's why the soils testing lab there at OSU in Stillwater, especially on crops like wheat, we're running off of sufficiency. We're not doing removal. So in our systems in our climate in our ecosystem here, that's the system that pays off for itself. We can utilize those numbers to fertilize that next crop more efficiently.

Trent Milacek 6:18

Yeah.

Dana Zook 6:19

So what about sufficiency? Josh, explain a little bit more like we did earlier. Talk about the sufficiency, what that means.

Josh Bushong 6:26

So for mo nutrients like rainy guys are talking about phosphorus and potassium. You're on our soil test index values that we get from those soil tests at OSU, we're on a melee three tests to get those estimates are looking at a sufficiency. And so you'll get that soil test index for phosphorus or potassium compared to the chart for the sufficiency levels and not tell you how much needs to apply. So we're looking at that and some guys get some reports from other labs and we'll get a report in parts per million. We can multiply parts per million times two to get pounds per acre that nutrient. So you can get a little back data as well. But we're looking at sufficiency. Say for instance, potassium, if it says you're at 225, I believe so test index is going to be a 95% sufficiency. So, no matter what you do, that crops gonna be capped at 95% of the field capability, unless you put out that I believe another 20 pounds of potassium. And so you start thinking well 20 pounds of potassium to get 5% more, then you start looking at what kind of production scenario are you in? Are you in a 30 bushel wheat crop or are you in 100 bushel wheat crop? So even at 30 bushel wheat crop 5% of that is two and a half bushels, two and a half bushels gone party still pay on an investment of 20 pounds of potassium.

Trent Milacek 7:56

And the thing about it is we all have yield goals and what we think it might be But you never know what your yield potential is, at the beginning of the year. So you know, if you think oh I can, I can absorb that risk, that's not a big deal. And then you know, come springtime, you have 60 or 70 bushel yield potential and you've lost 5% of that yield, that's gonna, you're gonna really feel silly.....(laughing)....because it definitely would have paid for itself.

Josh Bushong 8:21

So that's what you know, Southern Great Plains, there's a lot of factors that determine that yield potential. And so we don't have it as cush as some of those those I-state guys where they know year in year out what kind of range they're going to be on their corn yield, but we don't know if we're going to have that 20 bushel wheat or 100 bushel wheat potential this time of year. So obviously going off past yield production on that ground, you know what's capable of most years but stuff like potassium, phosphorus, you gotta keep on top of, you can't look at removal we keep them up. But as sufficiency especially goes back to how good was your soil sample We don't want to shortcut ourselves, but we don't want to be throwing money out there that we don't have to if we don't need to.

Trent Milacek 9:06

That's a whole lot of talk about sufficiency....(laughing).... So we kind of the main goal today is I think, in my mind is kind of getting to the point where we're fertilizing for cattle on wheat, we are talking about pasturing wheat. So, if I'm just a grain only guy, that's probably a more simple scenario kind of ...Where do I need to look at fertility on my farm for if I'm just looking at grain only and not wanting to run cattle on wheat,

Josh Bushong 9:34

If we're looking at grain only, or historical rule of thumb was been that two pounds of nitrogen is needed for a bushel of wheat. And so that's for the whole season. of obviously some guys have grown up with heavy anhydrous up front pre plant. And so we still had that mentality that we need to put out quite a bit in the fall but if we are truly in that grain only system, recent work last four years with Dr. Brian Arnall's crew looking at late season applications of nitrogen, we're still able to get that yield fertilizing in March. So we don't really need that much out there in the fall, because we just have more options to lose it where we have the rains, droughts are leaching, volatilization, de-nitrification, there's a lot of ways we can lose that nitrogen. So there's no need to put out more than we need. Start talking about what we need, I would say at least 30 pounds, just to get the crop established. Ideally, we want just a few tillers on that wheat, it will survive the winter here in Southern Great Plains, so we don't need that much for a grain only system.

Trent Milacek 10:37

Now, growing up in the southern Great Plains, I've never really thought about our growing season as being long, but it is very, very long compared to other parts of the world and other parts of the country. Yes, you think about putting some of that there. You say you're going full full rate of anhydrous up front and oftentimes, I mean, this year went out a little bit later in Oklahoma just because it was so wet all summer but we would see people going out August one when I was younger putting out anhydrous and it has to sit there all the way until May that basically whenever our yield is really made and and there's just so many opportunities to lose that and one of the reasons for that you look at the economics....anhydrous tends to be our cheapest source of N Yeah, you're looking at something like, I ran some prices here recently and you're looking at about 21 cents per actual pound of N for anhydrous source. Where with 46-0-0 you're like 36 cents. So it just keeps ratcheting up per pound of actual N and even though anhydrous per ton might be \$340 per ton where 46-0-0 is \$330 a ton since it's so much more concentrated that anhydrous is actually a cheaper source of nitrogen per actual pound of N. And then for our guys looking at liquid you know you're talking 38 cents per actual pound of N. So it just keeps getting more and more expensive. The farther away you get from anhydrous. So you know that's why we saw a lot of people going out up front, putting that anhydrous down because it's hard to do that in season.

Josh Bushong 12:02

Yeah. Especially if we're in those situations where we want that fall pasture. Yeah. So that's where we start Dana and talking about how much forage should we really be looking at producing in that fall? Are you producing one ton of forage, three tons of forage?

Trent Milacek 12:19

It all depends. Does it depends? Yeah.

Dana Zook 12:21

It all depends! I was giving you a deer in the headlights look. Don't put me on the spot like that! That's not nice.

Josh Bushong 12:28

When you look at the fact sheets and production manuals from OSU. We've shown that takes about 60 pounds of nitrogen to make a dry ton of wheat forage or small grains, whether that be rye, triticale, wheat, barley, or oats...it takes about 60 pounds of nitrogen to make a ton, or 30 pounds to make 1000 pounds of forage. So we started looking at that how much forage we're going to produce. If we are looking at one ton, we need another 60 pounds out there. So when you start looking at something where we are wanting forage off of, not just grain only. We have to have more nitrogen out there. So we're looking at, in addition to that 30 pounds, like in grain only, we might need another 30 or 40 pounds for forage. So we're looking at, you know, maybe 60 pounds up front for getting that full fall forage production.

Dana Zook 13:18

So Josh, does it take 30 pounds of nitrogen to produce 1000 pounds of dry forage?

Josh Bushong 13:24

Yeah.

Dana Zook 13:24

Okay. Was that what was said earlier

Trent Milacek 13:27

assuming you get rain,

Dana Zook 13:28

assuming you get rain,

Josh Bushong 13:30

Looking at our pasture fertility guide handbook. And it says, you know, western Oklahoma, maybe one to two tons dry forage per acre and then here 1 - 3 tons, that's a pretty big swing.

Trent Milacek 13:43

Yeah.

Dana Zook 13:44

Yeah, we had a little bit of a discussion prior to the podcast, you know, what is actually....

Trent Milacek 13:48

when you think about a hay bale being 1200 1500 pounds, yeah, that's a big difference in forage. When you think about one to two tons, or two to three.

Josh Bushong 13:57

There's other factors that we've seen that as well. Planning dates, big factor. I mean, obviously, planting the first September versus late October, you're not gonna get that three tons on October 30. as you would September 1.

Trent Milacek 14:11

I think most of our producers recently have been pushing planning date back because we've had so much trouble with armyworms.

Josh Bushong 14:17

Armyworms have been a huge deal. We're also starting to see some reports come in this fall. So they're going to be they're waiting on us. We've seen them in other crops. So it's gonna be another fighting issue again.

Trent Milacek 14:31

Well, so I talked about, you know, the source of nitrogen. And I think it's important for people to think about all the different areas are getting nitrogen from whether it's up front with anhydrous. And then

we talk a lot about, you know, the banding phosphorus with our crops. You want to talk a little bit about why we do that again?

Josh Bushong 14:51

Well, the reason why we're banding fertilizer directly with the seed, that's what they're usually calling for. So we're more efficient with the product placement, we're able to take more advantage of especially like I said immobile nutrients like phosphorus, it's not gonna move with the soil water, we need that close to the roots to get it in the plant, especially in low acidic soils, it's getting tied up and we're having aluminum toxicities, having that phosphorus right, there's gonna be more efficient. Looking at research, we're able to cut back that rate. So you're looking at your soil sample says you need 100 pounds phosphorus. If you're banding it might drop that by 20% and go with 80 pounds. When we are looking at fertilizers direct with the seed. Sometimes we can get some salting out issues or stuff like nitrogen or potassium, if we put too much can be pretty detrimental to that seed germination and seed health. So we want to limit that to about 30 pounds of nitrogen or potassium. So if you're looking at something like 18-46-0, so 18% nitrogen. You can go 150 - 160 pounds of actual product 18-46-0 per acre directly with the seed and still stay below that 30 pounds of nitrogen

Trent Milacek 16:11

that's on seven and a half inch spacing, probably

Josh Bushong 16:14

With all small grains we're talking narrow rows. We don't deviate with different row spacings like we do with canola and some other things

Trent Milacek 16:22

but the farther west you go, you might see guys with 12 inch hoe drills and things like that and you can get into some issues probably banding and salting out

Josh Bushong 16:30

The wider the row, the more fertilizer is going to be concentrated in that row. So you're taking 12 inches worth of product with the seed versus six inches worth of product with the seed. So essentially double how much fertilizer you put right there with the seed. dry soils, dry sandy soils you're gonna see more of a response so you might back off that rate. If you're in heavy ground, moist ground, good soil moisture. That 30 pounds is definitely a safe rate.

Trent Milacek 16:57

I like to think about different scenarios and I've got an interesting one myself because I need to plant a particular 80 acres for grazing and it was in crabgrass this summer but that things like a 4.9 to a 5.2 on pH so that's going to 1.) affect the root health and my wheat and it's not going to grow as well and I'm going to have lower forage. I'm also gonna have to band phosphorus and row to try to promote some of that regrowth but how many pounds of 18-46 do I need to run to kind of counteract that and then if I do that, am I getting any benefit from that phosphorus other than tying up aluminum?

I don't have the data off top of my head but definitely we've seen with typical rates of 100-150 lbs of DAP 18-46-0 it's been lightyears ahead of none at all. So I want to say a previous agronomist in southwest Oklahoma, Mark Gregory did some trials looking at broadcasts versus in furrow. He was able to cut his rate in half from like 120 pounds down to 60 pounds of product, it's still got the same forage production off of it. And so phosphorus is going to help with that ceiling vigor that fall forage production, as well as alleviate temporarily some of those other issues like aluminum toxicity.

Have you seen a lot of difference in varieties in terms of forage yield over the years and most a lot of Oklahoma varieties are bred for grazing grain, but anything from that standpoint ?

Josh Bushong 18:30

Oh, definitely have some research going. You can always find the fall forage production current report by OSU looking at different varieties on how much fall forage production they produce. And there's always you know, some towards the top that just tells you how much forage they can grow. And it's not all gonna be available to the livestock grazing it, some are gonna be more prostrate, so you're not gonna get that sufficiency is high or utilization factor is high. And then some they might produce alot of forage, some that sticks out in my mind will be like a Billings, excellent fall forage production, but doesn't recover from grazing as well. So that's reason why it was more of a grain only not a dual purpose. So there are different varieties that do better. Something like Double-stop. If you look at those charts I was talking about, it's not going to be high on the list for fall forage production. But what we've seen in the field time and time again, is it handles heavy grazing very well and continues to produce throughout that grazing period. So and these trials were letting it grow up and then clipping it at the end of the fall. And so you're seeing that total, but under heavy pressure, something like Double stops gonna outperform some others.

Dana Zook 19:44

Yeah, no, we saw that in some of our clipping demos that with the the recovery of that forage. So if you're grazing a really hard there are some varieties that just don't do well. And we saw that particularly in this demonstrations where we were kind of hoping for some recovery. We clipped it too low.

Josh Bushong 20:03

The plant needs to take in sunlight to grow. So we graze heavily that plants not gonna produce as much as it was just letting it go. Mm hmm.

Dana Zook 20:12

Yeah, we got to leave what? Four to five inches? That's what I would say.

Josh Bushong 20:17

Ideally. For wheat most time we're trying to grow as much as we can before it gets cold. And so then once it gets to that point, we start getting freezes. Soil temperatures start dropping in the 40s and 50s. We're not getting a lot of growth out of it. And so we're wanting to get that production before it gets cold. So they can graze on it throughout the throughout the winter.

Trent Milacek 20:37

Alright guys, so what I heard was need a soil sample as soon as possible because it takes time to get that information back and we're kind of into we're into planting season already for a lot of producers. If I'm going for grain only what, Josh, how many pounds do I need front?

Josh Bushong 20:55

Depending on your history 20 to 40 pounds up front of nitrogen from what's there plus what you put on? I know a lot of guys have air seeders now they're put down in furrow with the fertilizer. Please don't put urea. I know I said 30 pounds of nitrogen, but that's looking at stuff like DAP and MAP. But straight urea - you don't want to keep it blended. I know some guys who started blending their wheat with their fertilizer might get by with a day or two with a blended but the straight urea, it's gonna start causing some harm to that seedling.

Trent Milacek 21:28

Okay, if I'm going out for grazing, but now I'm pre plant, what do I need to look at?

Josh Bushong 21:34

At least an additional 30 pounds on top of what you would do with grain only. But like I said, it's all dependent on what your forage production potential is. If you think you can typically get three tonnes of forage, you're gonna need 180 pounds of nitrogen out there. Okay, but most of us are going to be in that one to two tons so 60 to 120 pounds nitrogen in the fall to get that optimal fall forward

Trent Milacek 21:59

and hopefully fertility-wise, that'll get us to Christmas. Yeah.

Then we'll start talking a little bit about top dressing and things like that afterward, trying to get us through the rest of the spring in the spring grazing period, and then also looking at graze out producers as well. So, any other comments, guys. I think that's pretty much as a wrap for small green fertility at least looking at the fall. I really appreciate everyone joining us for this podcast and we'll talk to you next time.

Outro 22:34

We hope you've enjoyed what you've heard. If you'd like to hear more or follow up on the discussed topics, please reach out to your local county extension agent or she has a presence in all 77 counties with educators eager to assist you. Also, please consider checking the description for links to our social media pages and further information pertinent to the conversation. Thanks again and we'll talk to you soon

Transcribed by <https://otter.ai>