[00:01] Intro/Outro

Arkansas Rock Crops Radio, providing up to date information and timely recommendations on rock. Rock production in Arkansas.

[00:11 – 00:37] Jarrod Hardke

Welcome to Arkansas rock crops radio. I'm Jared Hartke, rice extension agronomist for the University of Arkansas System Division of Agriculture. Welcome rice fans to another episode of Rice and Advice. And today we'll be talking about mid-season and boot nitrogen applications, of course, in rice. So without wasting a lot of time, since it's just me rambling along today, I'm going to dive right into mid-season nitrogen.

[00:37-01:03] Jarrod Hardke

And again, since we're we're talking mid-season or true mid-season, we're going to keep those comments focused on varieties like Ozark, DG2 63, Yale CLA 18, stuff like that. So just to kind of, you know, start at the beginning and when we get to the end, we'll stop. So let's let's take a quick jump backward to, you know, how did we time mid-season nitrogen in the past for a lot of you.

[01:03 – 01:37] Jarrod Hardke

This is going to be a very brief repeat. But the old Arkansas three way split. So starting with that, that time historically, a smaller than what we used today. Pre-flood. Right. So small Pre-flood. And we're going to we would follow that with two mid-season applications. So when you go back to to those days of so we didn't have things like aggregate time to, to utilize and so we, we, you know, took advantage of a smaller pre-flood nitrogen shot, you know, really allowing, you know, less potential for loss certainly.

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Or differences in varieties too. But then we'd really, take care of the crop. But those mid-season applications, as things kind of progressed and went along and, and certainly a lot of research and data helped drive the idea of a bigger, heavier, pre-flood shot. Could, could really help push yields and really feed early growth and development tailoring. And so, you know, the transition to the Arkansas two way split. And so leading to that, that larger pre-flood application, a single larger mid-season application. So kind of turned into a very common standard in a lot of varieties. Today's has this recommending 105 pounds of nitrogen pre-flood 45 pounds of nitrogen mid-season has the most common. There's a few that are a little bit different, have slightly different, you know, rate requirements. But that's where we're shooting for. So we we have some other, you know, means that we certainly recommend where we can, you know, eliminate having to do a mid-season. But that's that's not really the focus today that has to do with early season stuff. So that, that general

framework again, of the two way split is still we're primarily recommending today on most situations for varieties.

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So that that same idea, but really timing is what it's changed. So what what is changed now from kind of where we were historically, which was shooting for a grain ring to half inch approximately, you know, timing. You could even go further back on some of the old stuff, even back to three way split, or, you know, how you get really hyper specific, like three quarter inch joint movement for some. You know, really get off in the weeds on on the past. They're not trying to do that, but focusing on on still the two way split. But we used to be so hyper focused on that, that timing, that window of joint movement or intermodal engaged in there and back to varieties that really what we've done over the years or part of what we've done in variety development, continuing to shorten the growing season of varieties where most all of that shortening has come from is really on the vegetative side, so that that that window or total period of time of reproductive growth from green ring all the way up to, you know, hitting maturity. Is it really about the same as it always was in some cases actually slightly longer. But that period from emergence to green ring, that window is what is really generally shortened. So we're, we're really staring at from the time that we fertilize and go to flood. It's, it's a pretty narrow window before we're at green rings. And so you kind of see where we're going here from, from a timing standpoint. We've known from for many years. It takes, you know, about 21 days for rice to take up pre-flood nitrogen can be slightly longer, but ballpark 21, it's mostly done at that point. And when you're starting to farden and we're now off, you know, seeing more common instances even when we're not light necessarily pre-flood, but lean on the lighter side of our window and the less than 21 days we're going to ring pretty commonly.

[04:48 - 06:16] Jarrod Hardke

So if we're we're throwing a mid-season out at 21 days for the rice isn't done taking out pre-flood nitrogen, it's not really ready for that mid-season meaning there's potential for that that mid-season application to to be less efficient or in some cases completely inefficient. You know, all start up, you know, plenty of directions that it can go other than in the plant. If the plant is still busy taking out the pre-flood nitrogen that's most readily available to it. So that's kind of the the gist in that shift in timing and how we've changed in our varieties and somewhat in our management, with the in kind of kind of leaning a little lighter on bigger rice before going to flood as well. So you start drifting those two things together. And again, yes, when the mid-season nitrogen goes out, we want to be in reproductive growth, but we're not trying to hit green ring or half inch in and no longer joint movement. What we're really looking for is, you know, roughly out to about 21 days. I'm sure out to that that 21 days is is we don't want to go earlier than, than that point, you know, three weeks. We don't want to go any sooner than that. But really, the sweet spot is more about 28 days or even slightly longer. So 4 to 5 weeks is kind of more of the sweet spot window after Pre-flood and

actually was incorporated to get that mid-season applied. And so pretty, pretty good pile of data that kind of led to that conclusion.

[06:16 – 08:23] Jarrod Hardke

And, and to give kind of a brief history of how that that kind of happened, starting from back in time. I started Rick Norman when he was still, still working with us prior to his retirement and revisiting mid-season nitrogen timing. And, the study, you know, we're working on together was, you know, it was predicated on looking at a timing beginning with growth stage of grain ring and then half inch and then, you know, week each time after. And that was kind of what was being revisited. And it just kind of happened through serendipity that that after a few years, there were there are a few sites in there of that data that that just looked a little bit weird, to be honest, and study in a little bit more closely. And I had had questions and we got to kind of going through it and found, the one that really stuck out, that kind of kind of showed out to us was, you know, naturally, we were we had a location that was particularly delayed through wet weather before we could get dry ground, put the pre-flood nitrogen out. And it was only just a week later that, that right after a week later, after the flood, that it was at Green Ring. And so being the study as it was, we we kept with our timings and went on with it. And there at the end of the year, you could see pretty clearly that the, the green ring timing, you know, which was just seven days after the Pre-flood floods incorporated, had no response to mid-season fertilization. Seven days after that, which was half inch in a row longer and no response to mid-season fertilization a week after that at 21 days. Secondly, a significant jump in yield response to mid-season fertilization. So and then 28 was even even just a little bit better. But you saw a pretty good like 20 bushel jump out at 21 days. And kind of one of those moments like, wait a minute, wait a minute. This kind of lines up with uptake data and what we might, would actually reasonably expect. And once you started digging back through some of the previous years, it started to become clear that once again, here's here's an, you know, site where it only we got the green ring, and it's only been 17 days since we went to flood.

[08:23 – 10:52] Jarrod Hardke

Well guess what. No response at Green Ring. And then it started to to move the needle at half inch. And anyway, different sites within those windows. But you got to where you could kind of easily predict out, we weren't at a minimum 21 days since Pre-flood nitrate was incorporated. We just weren't getting anywhere near the max response value from from that mid-season nitrogen. So again, far as best best bang for our buck, getting out to the shooting for 28 days is where we want to be. I we'll say with some of the difficulties this year, and I know a lot of mid-season nitrogen has already gone out at this point. We're getting on the lighter side, but I'm still getting some of these questions on some of this rice that still does need a mid-season or certainly even, you know, light planted rice here to go. So, want to, you know, make sure I still touch on this topic. So the how late is too late with some of the situation we're dealing with and this kind of dovetails in and it'll seem a little bit at odds with the next piece of this topic. I'm going to get to jump into. But really we wanted

to go out before light boot. So before the flag leaves are all the way out so we can say 28 days, but if we were kind of late or delayed and we're we're kind of coming up on that point, and we do want to try to go ahead and get it out. But all this we know from the days that we start to move into that window, that period of growth stage, then our chance of of a significant response on varieties begins to taper off. So we'll shoot for that. So shifting gears a little bit, but a good point to segue. I was talking about light boot nitrogen, some, you know, just short handed to, to the nitrogen application that we talk about in hybrid rice, which, you know, to, to bigger players, obviously a lot of, other options, but like t, 7302 and 75, 21 full page. So, plenty of other examples. But the, the the deal with the light boot nitrogen application in hybrid rice. So historic actually one of the absolute biggest reasons and pushes for that you know, improve stand ability on on some of the more lodging prone hybrids that we were growing years ago. So some of the other benefits were certainly observed. But but then improved sustainability was pretty dramatic. And so that really helped, to be a piece of what we were doing. So in more recent years, and now it's been a few years since this, since we did revisit this work on some newer hybrids with the goal, believe it or not, of trying to eliminate and get rid of that recommendation of the boot nitrogen.

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That was kind of the point in what was being pursued, you know. Is it still worth it? We need to get rid of it. So what we found is that even on on some, you know, hybrids that are, you know, less prone to lodging, it still helps, but also consistently show some other benefits. So, very, very briefly, once again, the the light boot timing we're referring to, that's the flag leaf being fully out or you can see the leaf color all the way up to the boot split. That's that's kind of the rough light boot window. Applied a little bit earlier. So the flag leafs on the way up, maybe not all the way out. That's okay to not not the end of the world to go at that time at all, but really don't want to be moved up much further than that and more, you know, we don't want it going out on hybrid like a true mid-season timing once you move way on up further, like more of a true mid-season timing, we we typically see increased plant height. And I was that's going to run up lodging potential more lower right growth of tillers that probably won't actually make any yield or make to the finish to contribute. But increasing you know, some disease instance definitely lodging. So really, really not a lot to gain by moving that up. We're we're feeding hybrids pre-flood so heavily, you know, optimally that we just generally don't have to get into that. The benefits that we focus on though are a bump and you keyword bump not not major increase, but a bump in yield, a bump in milling and then less lodging. So most of the time, like from our data, we can at time see what I think is a little larger than than real world expectation yield bump. We we consist I think we're we're still at the production level. You know, going to see 4 or 5 bushel gains sometimes see a little bit larger than that in some of the plot work. It happens. But you know, in another 2 or 3 points worth the head on milling maybe a half to a whole point, a total rise as well. And again, that that's without even any, any additional, you know, lodging benefits. You start looking at your price today and you start going, well, you want the cost of of your in flying. We're, we're going to be having a net return on that a positive net return on,

on this urea plus application. So the rate we continue to recommend is 30 pounds of nitrogen per acre, 65 pound urea per acre. Next immediate question as well. I get charged for a minimum of 100 pounds to plow. I want to go ahead and put out 100 pounds urea to five, because that's extra cost for another 35 pounds of urea. And and as we've looked at that periodically, we continue to not see a benefit from the additional nitrogen and got 200 pounds.

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So save the money on that 35 pound difference. Just stick with the 65 pounds of urea and and head on down the road with that. We've also so far not seen that a foliar nitrogen product is is equal to this urea application. Certainly plenty of comments questions, surrounding, you know, putting in some type of foliar nitrogen product, say, if you were already going to be going across with a fungicide around that timing. Not saying doesn't provide any benefit. Not going there, but but it hasn't seem to be, you know, the the same response or overall return for that. So some ins and outs there, but stuff that we're still pursuing, continuing to look at additional options. Again, anything we can do to change, you know, tweak or change our recommendations to help us with profitability. Remember there there are always exceptions. Anytime we're talking about mid-season or late boot nitrogen, they're always exceptions to these these what we'll kind of call supplemental nitrogen. Application price looks like it's running out of gas. We're we're not saying oh yeah. Hold off. Wait. If it's always possible something happened to impact our preferred nitrogen, the efficiency of it or how rise to took it up. Or every once in a blue moon, a field that only got, say, half flown, you know, only half the pre flood went out and by mistake the other half didn't. Or sometimes this field gets missed get wrote down as that didn't. So there's always a chance to want to go earlier than kind of what we're talking about because something doesn't look right. But I will say I would like to emphasize with with the ability to get some tissue samples pulled and get results back in just a couple of days, the speed with which we can do that now, I love to see that even though for a lot of nutrients, we're we're not really quite there on the specific value we want to see you have is optimal really like to confirm what the shortcoming is from a nutrient standpoint, because it wouldn't be the first time that even, even myself standing in the field. But I'm pretty sure it's this, but I'm not 100% sure. And send off, sample and go, oh, wow. I mean, it may actually be showing that deficiency, but it is because it actually has this problem, this this other nutrient is deficient. And for whatever reason, it's showing the symptoms, but it's actually this one we need to fix. So that's one way that we can prevent an unnecessary application and fix the of the problem, and typically do so within just a few days. So we can we're not losing anything, just by those couple of days of waiting to get those results back. So let's try to do that. If we have a situation, we can always put out what we call some ten by ten blots, which is a touch slower.

[16:36 – 18:50] Jarrod Hardke

But where we actually put out some, some plots of different fertilizers really quickly to confirm. But any more, by the time we have to wait a few days to get a response out of that rice, we can just as easily have tissue samples back anymore. So always something to consider in our approach. One situation, or maybe it's not one, but we'll just generalize the situation here. Kind of falls in line certainly from from a lack of variety standpoint on some things that have happened. We've been delayed a lot this year across the board. So let's say, you know, pick a variety, but it's already out to say 1.5in of joint movement. But it's only been 21 days since since it was fertilized and flooded. First thing that means we were late getting the flood. I mean, who wasn't this year that that happened? But it also means we need to try to wait another week to apply mid-season. As long as the rice is otherwise looking good and healthy, which a lot of this in these scenarios is. Remember, it may take just seven days to get from grain ring to half inch, but really to get to one and a half to two inches moving only takes us another week. I mean, it really starts to take off oftentimes right after that. So you get a lot more elongation in, in that same period of time than we had in the first seven days. So that's not uncommon. That means you're within a week, after half an inch still at that timing. So we're still good. Wait for that 28 days, if we can at all. Unless it has somehow gotten really, really late. But let's say the next field over is actually a little further along, and the flag leaf is actually already on its way out. Well, if we're already at least at 21 days, yeah, we might want to try to apply before it gets into late. But so again, similar, you know, thing if it's and we were going back and forth between here's where we want, you know, your line varieties to be fertilized with a true mid-season. And here's where we want hybrids to be with, with a boot shot. And they are separated and they are for a reason. And the way that we've observed the benefits of those application lines and timings, they're they're just, again, genetically different. They perform and respond different. So let's try not to, you know, blur the lines between these two.

[18:50 – 21:35] Jarrod Hardke

As much as we can avoid that day. They each have their own benefits for certain reasons. So, at the end of the day, if we can shoot for those timings, it does set us up for the best possible success, whether it be on a variety or a hybrid. There will be some situations where it is getting so late that say again on the hybrid, the boot shot that it really just hasn't been very long since the pre flood went out and went out really late and went out with a really large shot and there's potential an argument to yeah, just leave the boot shot off. And that's going to be understandable. Very very large for dark green and holy nitrogen up price. We may skip that cost. Considering we know we've already kind of heart ourselves a little bit by being to, like, in the same could arguably, you know, be true on the variety side as well. It just comes down to some of those timings and situations. So feel free to reach out if you want to discuss some of those very specific scenarios that are that are kind of coming up, but if it's otherwise, the timing is is somewhat making sense and we can get it out within these described windows where, you know, this is where we see the greatest benefit and we see the. Net returns from these applications. So, that's where we have the best chance of getting the most out of the money we're going to spend on, on the European flying and

total application costs. So on another brief note about mid-season and boot nitrogen as it relates to fir irrigated rice situations. That's another one that continues to come up. So when we get into fir, get a dry start and we're doing a lot of splits, we always say there's there's a lot of ways we can still do well. And for gated rice, as long as we're splitting the nitrogen up some kind of way. But a lot of those strategies, whether it's variety or hybrid, you know, end up being, you know, three applications of 100 pounds urea for applications, stuff like that. When we're talking about the varieties, weight usually ends up working out is that strategy leads us to that that last application that we're doing typically lines up with being at a mid-season nitrogen, you know, type timing. We're on into joint movement, you know, even half inch and even beyond what that last one. So typically that's kind of settling us for full yield potential in the varieties. Depending on your exact chosen strategy, a split because there, you know, some we do some other, you know, a little bit different splits than that. But hopefully that last kind of follow up shot ends up in there. So there's not really a need to do anything additional. Your continuation of that timing is really going to those accumulate, your continuation of those splits is going to lead to that midseason, not to the timing.

[21:35 – 23:01] Jarrod Hardke

In contrast to again, on hybrid as we're finishing up that that's the the boot shot on hybrids. That's not what we're after. Is that primary yield driving that it's those other factors we've talked about a little bit of grain yield, but also the milling and stand ability that we still want it to be out there. And several years ago when we were, you know, heavily looking at the different early season splits, you know, to drive and recommend for hybrid rice for irrigated, that was around the same time we were doing a lot of the flooded rice boot nitrogen shot work. So we didn't go fully in depth, like take a really deep dive into looking at the benefits that boot shot on for irrigated. We just took a little bit of a limited look and we didn't go any further because really, the results really lined up just exactly like what we were seeing in the flooded rice type response. So even if we've you know, driven the nitrogen pretty good early with all those total splits, that was still to drive the early yield and give us all the nitrogen we needed to to be our early season. And we still see that those same benefits out of that light boot shot on for irrigated rice, you know, as a supplemental application. So we still want to continue it there. So that's just quick rundown on, you know, similar timing strategies for gated compared to, you know, some of the situations where we more typically get into on the majority of our acreage that's still flooded rice.

[23:01 – 24:06] Jarrod Hardke

Once again, if you have any questions, feel free to reach out. I hope you've kind of enjoyed that, that rambling discussion of mid-season and light boot nitrogen. Please check out our website WWE Dot at UA Exodus, Edu slash rice and the Arkansas Rice Update newsletter that can be found at Arkansas crops.com. You can also sign up for to get the email version of that in certain post on social media and stuff as well. The rice management guide, you can look for a copy of that at your county extension office or download one from online.

Always with a lot of these question topics, covered. Always feel free to reach out to to your county extension agent for, further discussion advice as well. You can sign up for our text service by texting the word rice to (500) 130-0888 three, and feel free to get Ahold of me at any time with any questions. And thanks for joining us for this episode of rice and advice on Arkansas Real Crops Radio. Have a nice day.

[24:06 – 24:22] Intro/Outro

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