Row Crops Radio

S2 Ep21: Rice Weed Control using Cultural Methods and Application Technology

[Intro] Arkansas row crops radio providing up to date information and timely recommendations on row crop production in Arkansas.

[Tommy] Welcome to the Weeds AR Wild podcast series as a part of Arkansas Row Crops Radio. My name is Tommy Butts, extension weed scientist for the University of Arkansas System Division of Agriculture. And thank you for joining us today for this week's Weeds AR Wild podcast.

[Tommy] This week I happen to be joined by my graduate student, master's student Noah Reed. We're going to chat a little bit about his research projects that are funded by the USDA, National Institute for Food and Agriculture and looking at some different cultural practices for weed control in rice. But before we jump into some of his results and things like that, I just wanted to throw it over to him to let him introduce himself and just give a little background on him and what he's hoping to do when he's all done with his master's degree here. So, Noah, thanks for joining me on the podcast today.

[Noah] Thank you for having me today, Dr. Butts. It's a pleasure. I'm glad I can be here talking about some of the stuff I've seen in the last year and also this growing season too that'll be in my research. So I actually grew up in Cabot, Arkansas, so I'm a native. I got my bachelor's at Arkansas State University, graduated there in 2020. Really didn't know what I wanted to do. I grew up on a cattle operation, but I had a plant and soil science degree and then I happened to find Dr. Butts. And so I ended up starting on my master's degree, and I'd like to either start scouting or find another home, in industry somewhere along chemical or anything along that lines.

[Tommy] Awesome. Well, that sounds great Noah. I appreciate it and appreciate you joining me today just to chat a little bit about some of these results. So first of all, you know, again, I wanted to mention that a lot of his projects and a lot of his funding is provided through the USDA, NIFA. And so that was a great opportunity from a federal agency to give us some funding to help get this project off the ground. And that's in addition to the other funds that we get from Arkansas Rice Research and Promotion Board and some other USDA ARS sources. So I appreciate all of that funding. But based on these specific projects, what we really were trying to investigate was a drill spacing

effect on weed control. And if we start, you know, changing up our widths of our drill spacings for planting rice, how might that impact our weed control? So, Noah, you know, first of all, just why is it important that we investigate these drill spacings or even just in general other weed management strategies outside of just chemical control?

[Noah] Yeah. So to get some good points there you made. I mean, obviously the first one you think of is herbicide resistance and you know, along that line some barnyard-grass. And Palmer Amaranth is making it very hard to control nowadays with a lot of these chemical options. So we need to investigate other ways that we may be able to manipulate our rice production and produce better results. And, you know, on that front, some environmental concerns. You know, it's getting more heavy regulated out there on the chemical front, too. So we need these other options for covering these hardy weeds that we're not able to stop.

[Tommy] That's right. Really just trying to throw as many things as we can at it, right? Have more tools in the toolbox. Every little bit adds up and helps. And that's a great reason why we're trying to investigate some of these other things. So just diving into your projects, you know, what specific drill spacings are you investigating?

[Noah] So I actually look at four different drill spacings in all of my studies, starting with the five inch, a seven and a half inch, which is the most common and the most used one in the state of Arkansas. And then we also have the ten inch and the 15 inch, which when you get out there thinking about it, 15 inch in rice is very, it looks crazy.

[Tommy] Yeah, it looks crazy in your trials to see 15 inches out there. Yeah. It's a very unique experience to see 15 inch rice.

[Noah] But when you get into it and you start looking at it that way and you think of, you know, our soybean production or any of that, you know, there's other, we want to try to match that and maybe, you know, make it easier on the producers to be able to keep along that lines and have, you know, if they are to get precision ag planting plates for rice. And so it would make it easier on them just to be able to throw the plates in in their planter and roll on if they needed to plant soybeans or rice, you know, corn or anything of that. So if this 15 inch is still able to, you know, have good weed control, then it wouldn't be a bad option for the producers to have.

[Tommy] Yeah. And like our soybean or cotton or corn with the seed singulation possibilities and everything else with our precision planters, you know, if all of that could get transferred into the rice industry, too, and have a very precise placement of our seed, that could be a huge benefit to as well as us, you know, for establishing a good

stand and getting a nice uniform, emergence and everything else. There's some real positive capabilities there, capable potential, at least if we would move towards some of those precision options. But like Noah mentioned, that all boils down to is that going to really negatively affect our weed control or not? Because we're already limited in options, putting us on, of course, in another, you know, back pocket corner there would really hurt. Ok, so great. Outside of that, I mean, I guess just talking about those drill spacings and the fact that we've got some real narrow rows, a five inch up to that real wide row of 15 inch. As far as canopy coverage, what does that kind of look like? Because I know you're taking some drone imagery and some different images to try and really assess that canopy coverage? What does that look like as far as their canopy closures between those drill spaces?

[Noah] Yeah, of course. When you think about it, you know, canopy coverage while looking at just the drill spacing aspect, I mean, that's the main thing is, you know, reaching that canopy coverage point to be able to prevent other weeds from coming up. And so, you know, it's the five inch canopy, you know, it's closing a lot earlier, closer near the flood timing, you know, your smaller the seven and a half to even some of the tens. But then you start getting up into that 15 range and it's closing closer to the joint movement. So it's just having that delayed reaction. And you can actually see from an aerial point of view, you know, how much the weed pressure has come and compared to that narrower drill width spacing.

[Tommy] Yeah, I think that's what's been interesting to me is that the fact that the fifteens can close their canopy. Like I wasn't even sure at first that they would ever close their canopy, but they can get a closed canopy, but it takes a significantly longer period of time for it to get there. And in that time there's just a lot more opportunities for weeds to germinate and break through the canopy. And we're noticing that that delay from looking at images.

[Noah] That delayed, from looking at images, you can see that delayed reaction and, you know, that negative effect it's having on for the weed control. So yeah.

[Tommy] So generally when we're talking about the drill spacing effect on weed control, I know you had some data from last year and we're collecting more data this year. A lot of the stuff we're talking about is preliminary data. But you know, based on some of your initial findings and stuff from last year and observations this year, you know, is it pretty, does it look like it's pretty significant that narrow rows are reducing our weed pressure? Do you think producers could succeed with 15 inch rows? What's it kind of what's, in your opinion, what's it kind of look like?

[Noah] So last Tuesday you know, analyzing that which, you know, this year I haven't been out there in the field, but being out there in the field we've actually seen it, but so you start going down that narrower that 5 to 7 and a half and ten, you can actually see it, for one this year. And two, there's actually no data to back it up that it is, has better weed control than the 15 inch. And so, I mean, the producers may be able to succeed with 15 inch rows, but, you know, they're going to have to find other ways to control the weed control. Otherwise, they're not going to be able to produce the yields they need to match the five, seven and a half and even the tens is still you know, all three of those are pretty even compared to the 15's.

[Tommy] So probably things like getting even more residuals out there and overlapping residuals as much as possible would be really critical on fifteens and maybe even trying to bring the flood a little earlier, something along those lines?

[Noah] Of course. And, you know, and as a, you know, plant in a hybrid compared to an inbred as a 15, because it's going to have that prolific growth, which you're going to want it to try to produce that canopy. Otherwise, you know, that inbred rice might not be able to do it. It's going to be harder on the weed control.

[Tommy] While speaking of that cultivar impact. So I know we've got a study looking at that too, you know, canopy closure and weed control and out of your initial results, like I would agree with you too, with your statement right there. Right. The hybrid has a much higher probability of being able to tiller and fill that space in better. But in our cultivar study, have you seen an impact on chemicals?

[Noah] So actually we haven't, you haven't seen that aspect. But with this next year, you know, data, we might actually be able to see it, you know, when everything's all together, which we haven't seen it from last year's data.

[Tommy] No. And that's a good point because like you said, too, maybe we didn't see it last year. Maybe we will this year. But the other thing is, is it might be one of those situations where we don't see it necessarily, but if there's . . .

[Noah] Of course if it's a good possibility, we can see it.

[Tommy] Yeah, awesome. As far as row rice goes, we do have a study in rice to looking at the drill spacings and the bed widths. You know, if we're if we got our furrows based on 30, 38 or 60 inches and we're doing these studies across the state at multiple locations. So I think you've got three locations this year in the state.

[Noah] Yeah, one in Mississippi.

[Tommy] That's right. So, yeah, so Mississippi State over there, Hunter Bowman and Jason Bond are collaborating with us as well. And so they're replicating these studies. And so, yeah, so four locations total this year, three in Arkansas. Had two in Arkansas last year and one in Mississippi last year, too. So a lot of, a lot of data coming in for this project. But on the on the row rice side of things, have you noticed anything with the drill spacing or bed widths?

[Noah] So last year's data, you know, we saw kind of the similar results that we've seen in the other studies with the drill spacing that the narrower it was producing better weed control than the wider drill spacings but on the furrow, you know on the bed widths we haven't seen any differences that are significant that you would want to see you know for different bed widths.

[Tommy] Now and that makes sense to you. And I would say that might be a little bit of a factor of our setup with our small plot research. We got into a field scenario and especially this year when it's been so dry and so hot, it's been a challenge for a lot of people running water and keeping everything as watered as they need to be. If you don't get those beds completely whicked in the centers, we might have a lot more emergence or something at the top of the bed than we would in other scenarios. But with our small plots, we've been able to keep it whicked really well, no matter that bed width. And it does seem like it's been pretty successful.

[Tommy] So one of the final things on your projects I wanted to hit on to, another aspect was looking at nozzle selection and how that might impact spray coverage, but also weed control. So, you know, the different nozzles we tested, we had some single fans and dual fans in there and different droplet sizes ranging from a fine to a medium spray all the way up to like an ultra-coarse spray. So what have you seen on that front as far as coverage goes?

[Noah] So on the coverage, of course, so we've seen our, on our, you know, our smaller droplet sizes, they produced a greater coverage compared to our coarser droplet sizes. We did not see any different weed control between the droplets. We did see a coverage standpoint. And I mean, if you're going to have problems with weed control, it's going to go to the you know, the broader, you know, the coverage that's getting less coverage compared to the greater coverage you're going to get less weed control.

[Tommy] Yeah. So I just want to reemphasize that's a great point from Noah, is the fact that, you know, in our initial finding so far now may change this year again. But, you know, in our initial findings, we didn't see a weed control effect based on our nozzle selection, but we saw a pretty significant coverage difference depending on the droplet

size. And so, like Noah said, if you're going to have a failure, it's going to fail where you had less coverage. And so making sure that we can maximize that is really important. Now, did you notice at all between the single and dual fans a difference . . .

[Noah] So on the single fan and dual fan, we actually have two different dual fan nozzles and then three single fans and the dual fan nozzles you would think would produce a greater coverage, getting the two different lines coming out, but we did not see greater coverage from any of the single fans compared to the dual fans.

[Tommy] It basically just boils down to a droplet size effect.

[Noah] Back to the droplet size effect.

[Tommy] Awesome. Well, that's really great Noah. Did you have anything final that you wanted to talk about with your projects or anything else you wanted to add?

[Noah] No, I just wanted to say thank you to everyone that's helped me on it, which, of course, we still have, you know, harvest and all that on my on my projects. And I'll be curious to see what this year's data produced, you know, compared to last year's data and find my all my findings, my initial findings on everything and, you know, really close it out and see what see what all of this is about.

[Tommy] So, yeah, Noah, that's great. And so just to reemphasize to you, like we said, we wanted to emphasize this is some preliminary results between last year's and just some initial looks into this year. Noah's going to be taking all this data and summarizing it over the winter and in hopefully between the two of us will be either presenting in more podcasts or meetings or other things this winter to really kind of solidify some of these results and what the impacts might be if we move to more precision ag approaches or even what our standard approaches look like right now. So that's great. Just a few other real quick tidbits I wanted to hit on. As always, outreach. If you ever, you know, need to get a hold of us, feel free to contact us with any questions, any ideas for podcasts, all those kinds of things. Let us know.

[Tommy] Make sure to check out our website, uaex.uada.edu/weeds. Grab an MP-44 from your local county extension office or download them from online. It's got all of the information that we could possibly have in there, and it's just a great handy guide to have for any kind of questions as far as rates and timings and all that kind of stuff. And if you haven't yet, sign up for our text service, you just need to text weeds to 501-300-8883 and we try and pump out as much information through that directly to your phones as well. So just wanted to get those outreach things out there.

[Tommy] Once again, I just wanted to say thank you to USDA NIFA and USDA ARS and Arkansas Rice Research and Promotion Board for contributing funding that's to this research as well as these extension outreach events and just providing these opportunities for both Noah and myself to be able to conduct this research and publicize it as much as possible. So I really appreciate that. And thank you to all of you listeners as well as for joining us for this podcast and continuing to tune in and get this information from us. So I appreciate that as well. So with that, any last comments from, you Noah?

[Noah] Just thank you, Dr. Butts, for having me on. This is a cool experience. And, you know, any time I get the chance to talk about any of my research, it's exciting.

[Tommy] Awesome. Well, I appreciate you joining me and I appreciate you doing all the hard work this summer. It's been really great and you've done a really great job. So I appreciate it all. Noah.

[Noah] Thank you.

[Tommy] So with that, thank you all again. And thanks for joining us for this episode of The Weeds AR Wild podcast series on Arkansas Row Crops Radio.

[Ending] Arkansas Row Crops Radio is a production of the University of Arkansas System Division of Agriculture. For more information, please contact your local county extension agent or visit uaex.uada.edu.