

**[00:01] Intro/Outro**

Arkansas Row Crops Radio, providing up to date information and timely recommendations on row crop production in Arkansas.

**[00:11] Jason Norsworthy**

My name is Jason Norsworthy, Distinguished Professor and Elms Farming Chair of Weed Science with the University of Arkansas System Division of Agriculture. I'm joined today by Dr. Bob Scott, extension weed scientist, as well as two graduate students that are in the weed science program here currently. And that would be Tristen Avent and Lane Pierce. First of all, Bob, it's good to have you on here and it's good to have our guest today. That being, again, our two graduate students.

**[00:41] Tristen Avent**

Thank you. Yeah.

**[00:41] Bob Scott**

Good morning, Jason.

**[00:43] Lane Pierce**

Thank you.

**[00:45] Jason Norsworthy**

Okay. Hey, so what we're going to do today is we're going to talk about a little bit about y'all's research, but before we get to your research, let's just talk about a little bit about yourself. And Tristen, you've been in the program now you got a master's here. He's you're you're getting close to, getting towards the end of a PhD, you're on the downhill side of of a Ph.D.. And so tell us a little bit about how you ended up at the University of Arkansas.

**[01:12] Tristen Avent**

Yes, sir. So I've been here since 2019. I actually started on my master's degree that fall, working in rice. And really and truly, I came here because I wasn't sure what I wanted to do. After my undergraduate degree, I got a degree at the University of Tennessee at Martin. I took an internship with Gowan Company, ended up falling in love with research and I got introduced to Dr. Norsworthy in actually a Stuttgart rice field. And so I decided that I wanted to go and get a master's. I decided that I wanted it to be in weed science. And so I chose the University of Arkansas because it is by far one of the most competitive programs out there in weed science, if not the top program. In terms of weed science research, I wanted to work with new technologies. I wanted to actually make a difference for producers. And so that's how I ended up landing here at the University of Arkansas.

**[02:05] Jason Norsworthy**

Lane, you've been in the program now, I guess, what, three months? Four months? Probably, yeah, probably three months. And, you know, I guess you finished up over at A State. Tell us a little bit about how you, you came to the University of Arkansas.

**[02:19] Lane Pierce**

Yes, sir. So I'm a first year graduate assistant here at the University of Arkansas Food Science Program. During my three years or four years at Arkansas State, I spent three years as a crop scout and one in retail ag. After graduation, I started a full time consulting with Eddie Cates in Northeast Arkansas. Mr. Eddie really pushed me to come and pursue a master's degree, and he spoke very highly of Dr. Norsworthy and his weed science program. So after a little bit of talking with him I scheduled a tour with Dr. Norsworthy and that led me to coming up here meeting him. After my tour I realized how valuable this program could be to my long term career and how much it can help me advance and be the best I can be.

**[03:00] Jason Norsworthy**

I'll tell you, you mentioned Mr. Eddie Cates. Eddie Cates spoke very, very highly of you, Lane, and I'll say this, I haven't been disappointed in you since the three months you've been here. You've been very, very impressive in terms of picking up on technologies, and you really have fit in well within the program. So let's talk a little bit about what each of you are working on. And Dr. Scott, I mean, you feel free to chime in here, but really the goal today is to kind of get to know the two of you and get to know your your researh and really some of the findings. Lane, I understand you're just starting, so you're going to have fewer findings. You're going to have more, here's what we're trying to answer. But Tristen, let's start with you because your researh tell us a little bit about your researh from a farmer's perspective. What questions are you trying to answer?

**[03:54] Tristen Avent**

Well, first and foremost, Dr. Norsworthy, really, I mean, I think really the thing that we need to point out is that, you know, both of us primarily work with See and Spray. And so my Ph.D. researh is centered around the economic aspect of it, as well as the weed control aspect of it. I've been working with this project now for my third summer, and we're just working with trying to determine is this providing the same level of control as our traditional broadcast applications? So we're looking at it with herbicide programs. We're also looking at whether or not it's providing savings. And one of the big things that we're seeing with this technology is that if you have the right settings and you have a good, strong program, it can look a lot like a broadcast. Now, as far as what questions farmers might want to know, obviously they want to know if it looks as well as a traditional broadcast and they want to know if it's actually helping their bottom dollar. And so that's what my researh is trying to answer is those primary primary questions.

**[04:58] Bob Scott**

Let me jump in just real quick for those people that are listening that that are a little like me, I've been kind of out of this for a little while. What is See and Spray? Can one of them just tell me what that is?

**[05:12] Tristen Avent**

So, yes, sir. See and Spray is John Deere's New Precision Application Technology and so it is a commercial product on the market. They have See and Spray Ultimate, they have See and Spray Premium. They also had See and Spray Select. But that's a little bit older now. And so this technology uses machine vision to identify weeds in the crop and triggers applications while it's passing through a field. So, you know, some systems that we, we've seen, you can fly a drone and you can scout for weeds and then it marks those weeds and then you have another sprayer comes in the field later. This actually has simultaneous

detection and action. And as far as I'm aware, this is the only commercial product in the U.S. that is being sold. Now there are a couple other companies out there working on technologies like this. But as far as on sprayers today and so from a factory, this is the only one I'm aware of.

**[06:09] Jason Norsworthy**

So it's a targeted spray. It only sprays really where the weeds are. That's that's the goal, is that correct?

**[06:16] Tristen Avent**

That's exactly right.

**[06:18] Jason Norsworthy**

Okay. And so with that, when you think of technologies like that, Lane, I mean, some of the, some of the questions you're trying to answer are pre-emergent herbicides. Tell us a little bit about pre-emergent herbicides and what you're doing with them.

**[06:33] Tristen Avent**

So I'm doing my research with the See and Spray Ultimate and the See and Spray Premium machine. I'm using a strong and weak pre-emergence just to basically see the effectiveness and the economics and see which pre-emerge may help better than another.

**[06:49] Jason Norsworthy**

So, so basically you're working in cotton and soybeans for our listeners you're in cotton and soybeans and you're trying to understand what impact selection of a pre-emergence herbicide has on the utility of the See and Spray. And so what's going to happen is Lane, you've got some weak pre-emergence herbicides we're not going to call them out by name here but you've got some weak pre-emergent herbicides in beans, you've got some strong pre-emergent herbicides in beans, same in cotton. And what we're expecting is the strength of that residual is really going to dictate how much area we're having to spray from a post emergence standpoint. Another aspect of your research, talk to us a little bit about. I know that we're doing tank mix and tank mixing work and that's one could argue that's See and Spray related. I could even contend that may or may even be separate apart from See and Spray, but on your tank mixes where you have a dual boom where can actually separate products versus having to spray them simultaneously. What's the goal there? What are we trying to accomplish.

**[07:59] Lane Pierce**

Yes, sir. So you're using a dual boom system here, and we are trying to accomplish what, different herbicides might, how they might act differently, being separated instead of being put together.

**[08:11] Jason Norsworthy**

Yeah. So basically when you start putting herbicides together today, we run single boom systems. That's how we broadcast herbicides. And so when we tank mix herbicides out, you know, you tank mix an auxin herbicide with a graminicide. What happens to the graminicide? We antagonize the graminicide. And so basically what we're trying to do is we're trying to split those apart with the goal of hopefully minimizing. And we've had some work we've seen some work in the last year or two here, as well as in other programs, that's been involved in See and Spray that has shown the benefit of separating, for instance, graminicides and auxin herbicides. Tristen you've got, you've got a trial, you've got about a six acre, eight

acre trial. Looking at the long term implications of technologies like this and there's some intricacies associated with the See and Spray where the grower has access to what we're going to call a sensitivity button, where basically they can turn that up, where you get a high degree of sensitivity or a low degree of sensitivity as it relates to spraying weeds. Tell us a little bit about that and then we'll talk more about the research.

**[09:28] Tristen Avent**

So I'm going to backtrack just a little bit here because this this project actually stemmed from originally when they launched See and Spray Ultimate. This was a dual boom, dual tank system. And one of the big concerns that me and Dr. Norsworthy were sitting talking about one day is the fact that we thought farmers were going to want to combine those tanks so they could spray further on their acreage. And then actually John Deere commercially leased See and Spray Premium, which is a single tank, single boom system. And so in those systems, there's the risk that you might be inclined to go ahead and put your residual in that tank and spot spray those herbicides. And so we came up with this trial to compare a broadcast system. And then we also looked at two different sensitivity settings. So if a producer is wanting to save more money, they can actually save more money by turning down that sensitivity setting and what that looks like on that display is there's a scale with five different settings and you have small weeds or a small vegetation and then you have a large vegetation. If you're after large weeds and only large weeds and you want to save more on your products, you're going to turn it to a low sensitivity. And that's actually going to avoid spraying some of those smaller weeds, whereas a high sensitivity is going to tend to treat all of the weeds it can possibly see. And so with this study, we wanted to look at it over time. And what we have seen is that in the beginning you had very low savings with that high sensitivity in the first year. With the low sensitivity, though, you still had good savings. But by year two and even now in year three, we have more weeds present in the field. We've had more escapes at the end of the season and we're still missing quite a few weeds with that low sensitivity setting. And that's very concerning from our viewpoint. And even from a producers viewpoint, you want to control your weeds, you want to control your weed seed bank, you don't want to fight more weeds in the following years.

**[11:26] Jason Norsworthy**

So I want to reiterate what you just what you just said. Make sure I heard you correctly, because basically what you're saying is if a grower wants to initially save money, turn the sensitivity setting down, and they're going to save on their post-emergence herbicides. But what's going to happen is over time, because they're missing some of these small weeds, they're not spraying them. You're seeing more and more and more pig weed, correct me if I'm wrong, but we're seeing pig weed in these plots. And eventually we're going to get to the point where we're just having to spray the entire field because the pig weed population is out of control. Is that, is that a fair assessment?

**[12:06] Tristen Avent**

Absolutely.

**[12:07] Jason Norsworthy**

Okay. So along those lines, what I would tell you as an individual who spent most of my career in resistance management, that is one of the worst scenarios that we can be in from a standpoint of selecting for resistance to post-emergence herbicides. If we turn that sensitivity setting down and these populations begin to increase over time, we're going to select for resistance not only really to our soil

residual herbicides, but even our post-emergence herbicides, because the population is, is increasing over time.

**[12:40] Tristen Avent**

And I think another key thing too, to point out here is, you know, with that low sensitivity setting, if I'm coming out and I'm spraying my post on soybean and I miss 1 to 2 inch pig weed with that low sensitivity setting, and I come back in post ten, 14, 21 days later, those pig weed are going to be eight, ten, 12 inches tall and they're going to be uncontrollable with any of our type of herbicide applications.

**[13:09] Jason Norsworthy**

Questions around that. Dr. Scott.

**[13:12] Bob Scott**

I don't know if I'm a grower. That's a lot to think about. If, if I'm out there trying to decide how to use this technology on my farm, I'm just I'm just thinking through all of the issues and just to be honest. You know, sometimes we have a hard time just getting the regular application out, Jason So this may complicate things.

**[13:33] Jason Norsworthy**

Know, it is challenging. You know, one thing is that he's pointed out here, especially where you're running those See and Spray Ultimate, you've got these dual tanks and you know, with that Tristen, you've got two tanks on a sprayer. Are those two tanks going to run out at the same time? They're not they're not going to run out at the same time. So that's going to create some challenges. And so along those lines, I'm just curious, based on your research, based on and I know you've, you've done a lot of research by this point on See and Spray. If a grower were to come up to you today and say, Tristen, how much savings, what kind of savings can I expect in a normal year, normal weed population? What are you seeing? What's the range? What would you advise a grower from a savings standpoint?

**[14:26] Tristen Avent**

You know, I think that's a complicated question because I think it's gotten better every year in some ways. I think it's improved every year since I've been working with it. But on average what I'm seeing is somewhere around 30 to 40%. And, you know, there's a lot of other factors that can improve those savings and we can get into that here in a little bit. But 30 to 40% is, I would say on average across your acreage. That's what I would expect in savings.

**[14:57] Jason Norsworthy**

So along those lines, when you're sitting there and you're with the See and Spray Ultimate, a lot of times, well, it's not a lot of times we do we turn on multiple nozzles. So if we see a weed, there's multiple nozzles that can generally contribute to controlling the weed. I know that there are other technologies out there today that are being brought to market that only turn on a single nozzle rather than turning on multiple nozzles. Talk to me a little bit about the benefits, the pros and cons of of turning out multiple nozzles.

**[15:39] Tristen Avent**

But one of the biggest benefits of turning on a single nozzle is you're going to have much better savings with the technology. I think one of the big concerns about turning on a single nozzle is if you have a weed that's centered in between two nozzles and you have to turn on two. These technologies are using even, and so you could get an even higher dose on your soybean or on your cotton or your corn. You could actually end up injuring your crop if that is in between nozzles. The other thing, too, that I do really like about See and Spray is it turns on multiple nozzles. The way the system is designed is if a nozzle can contribute droplets to a weed, it's going to turn that nozzle on. And then so in some instances you might detect a larger weed, but you might not detect a smaller weed one row over. And so with it turning on multiple nozzles, it's actually treating that other weed that it didn't see. But that does reduce your savings.

**[16:37] Bob Scott**

So, Jason, if I'm hearing that right, you know, one of the things we looked at when pig weed first started evolving resistance to Roundup, you know, every spray boom at some point out on the end of that boom is not putting out a full rate. And so what we're talking about here is when one nozzle comes on, you're saying this technology will actually detect if it's not getting complete coverage of that weed, the other nozzle is going to come on and help it out.

**[17:07] Jason Norsworthy**

That is correct.

**[17:10] Bob Scott**

We're not leaving that gray area without the overlap.

**[17:13] Jason Norsworthy**

And I think that yeah, absolutely. I think that's the beauty of the technology, Bob, is the fact that if any nozzle can contribute to killing that weed. You know, we've talked a lot about low dose selection. You know, I've selected a lot of weeds in the Green House with metabolic resistance through low dose selection. And the last thing we want to be doing is providing less than a lethal dose to the given weed. And so I think with that, it's of tremendous value from a weed management standpoint to kill that weed. And generally we need a full rate. Also, Tristen points out, if you really think of weeds in the field, if you have an emerged weed, chances are you're going to have another emerge weed in the vicinity of that. I mean, that's just the clump. You get a clumping effect with a lot of weeds out there and even if that weed is small and you can't detect it by turning on multiple nozzles, you're killing these smaller weeds that are in the vicinity of that larger weed.

**[18:11] Bob Scott**

Well and if you're putting out a product like I can think of several but like Flexstar and it has some residual activity, you're also putting out a little bit of residual, right there in that spot where more could come up. I can see that as a benefit.

**[18:27] Jason Norsworthy**

You know, you're spot on. And so with that, you know that kind of leads me into some other discussions here and that's in these dual boom systems versus a single boom. So if I've got a targeted spray and I'll

come to some of the other technologies, a targeted spray, where I'm going to mix a residual in mix my post emergence together and I've got a single nozzle that I'm turning on. We generally like to broadcast residual herbicides to take selection pressure off of our post emergence herbicides. How much, how effective is it going to be using a single nozzle? Then also kind of what are your thoughts from a standpoint of tank mixing residuals and post-emergent herbicides, non-residual materials where you know, you've got weed populations like pig weed that are going to continue to emerge over the growing season.

**[19:23] Tristen Avent**

Well, you know, I said earlier, I would expect somewhere between 30 and 40% your savings if your tank mixing your residual is directly going to match how much residual you're putting out in the field. And that's a scary thought, if by chance, save, 60, 70% or my on my herbicides and my residual herbicide is in that tank, I've got 30 to 40% of the field has a residual on it. And so I'm going to have weeds that are going to emerge after the next irrigation or after the next rainfall that could actually force you to turn a two pass system into a three pass system. And that's more time, that's more labor, that's more diesel, that's more equipment wear and tear.

**[20:04] Jason Norsworthy**

I'm going to come back, that's more pressure on a post emergent herbicide.

**[20:08] Tristen Avent**

Exactly.

**[20:09] Jason Norsworthy**

And so with that that, you know, I'm not a big fan, especially on a single nozzle system is turning out. I'm not a big fan of tank mixing post emergence and residual herbicides. If a grower really wanted to invest in a single nozzle technology like that, I'd tell them, You really have to chase that with another sprayer that's going to broadcast residuals. And at that point, what have you truly accomplished? I mean, yeah, you've reduced the acres sprayed with a post emergence herbicide. From a saving standpoint, I'm not sure you've saved much because now you've got to two folks in a seat driving a sprayer across a field to essentially make was equivalent to one application.

**[20:54] Tristen Avent**

And I'm hoping to answer some of that with some of my economic work coming up this spring.

**[20:59] Bob Scott**

You know, Jason, I'm really intrigued by this technology. And I got to tell you, I know you said mentioned Eddie Cates before, we owe a lot to our consultants. We've had a lot of graduate students come through those guys and from all around the state. And I've spent time walking fields with some of them because, you know, I don't really know what it's like to to scout. I mean, I hadn't done that for a living. Those guys have. But I do remember early in my career going out with Dustin Angler up there in northeast Arkansas. I'm looking at rice and I'm thinking about this technology. You know, we walked some fields that were pretty clean from broadcast applications, you know, a good residual program down. And then they'd already come back early post, but they had some yellow nutsedge escapes and there was no resistance back then to Permit. So we walked and we scouted this field and we had them. We had to write down

every paddy, every levee that had nutsedge in it and the plane came back and only sprayed those paddies that needed it. So that was a sort of an arcaic version of this, just trying to save some money. Right. And only spray where we needed to. And man, I'm thinking back on that hot day now that we spent, you know, I don't know how big that field was. But two of us walking in to figure out what spray market and I just mount this technology today on a drone system and tell it to go out there and hunt for weeds.

**[22:32] Jason Norsworthy**

Well, so it's interesting that you say that, Bob, because I want to I want to kind of, and Tristen, again and I'm kind of come back to you because you've you've had a lot of experience with this. And that is, you know, I get questions all the time about drones and putting a drone in the air to find weeds and then go go spray weeds. What are your thoughts in terms of drones versus See and Spray? And again, I'm calling it See and Spray because that's what we work with. But that that type of technology, where 120 foot sprayer give me the ground speed on that spray and See and Spray Ultimate See and Spray Premium.

**[23:10] Tristen Avent**

They can run up to 12 miles per hour.

**[23:12] Jason Norsworthy**

Okay. Well, we're looking at trying to push to 15. So 15 miles per hour, 120 foot boom that is looking at, finding weeds on the go. Okay, drone, what are we doing with drones these days?

**[23:34] Tristen Avent**

Well, I mean, you got to have somebody that's got to have a pilot's license. They're going to have to come. I mean, you'd have to hire an applicator for a drone application like that unless, unless by chance that you do have your license. But then you're also going to have to get your aerial applicators license. The other question, is we're still trying to figure out whether or not these drones provide good coverage and good efficacy that research is ongoing right now, whereas the See and Spray system, we have a ton of data looking at these sprayers and then now we're just adding that that detection and action portion to that. And I've seen good results with these with the See and Spray. And I'm not very sure that we've got a ton of data on the drones right now.

**[24:15] Jason Norsworthy**

What I've seen with drones is, I mean, for the most part, and I may be wrong on this, we're not doing research in drones. But Bob, you mentioned you go up and you take a drone. You put a drone in the air, you locate the weeds. Once you locate the weeds and you produce that image, you then bring that drone back and now you've got to fly it and spray it. So it's essentially two trips across that field. If you're going to do targeted sprays with the drone. Carrying capacity, what's carrying capacity on a drone? I'm not going to throw out any numbers because I don't want to be wrong. But what's the carrying capacity on that See and Spray? What's the max? Give me the..

**[24:57] Tristen Avent**

12,000 or.



**[24:58] Jason Norsworthy**

1200?

**[24:59] Tristen Avent**

1200 and 1600 thousand gallons.

**[25:01] Jason Norsworthy**

1600 gallons sprayer I got a 1600 gallons sprayer going across the field 15 miles per hour with a 120 foot boom. I think that the utility, and again, I don't have a knock on drones. I think drones have a fit, but I think the utility of technology, like this that we're talking today, the See and Spray, the targeted sprays with the ground applications, I think they are going to have more fit across vast acres of US agriculture than what we're going to have with, with drone applications. That's my thought. So, Lane, just I want to get back with you here just a second. And, you know, Lane, again, you've been in the program here now for a few months. Just tell me about some things that you've learned in the program, some things that you didn't know before you got here, and some things that you're finding exciting within the program.

**[25:57] Tristen Avent**

So Dr. Norsworthy, I'm starting to learn a lot about plot research and in my research I'm doing a lot of stuff with the See and Spray. So that leading to more targeted spray areas and that's been very interesting to me to be able to run that machine and be able to see the savings that it holds for the future of farming.

**[26:16] Jason Norsworthy**

Okay. Tristen, any other thoughts on targeted sprays? Some things that we can do in, other other ways of saving money. I know you've looked at some other ways of trying to save money with targeted sprays. Tell us tell us a little bit about that.

**[26:33] Tristen Avent**

So, Lane, actually, we haven't started to initiate this trial, but he's got a trial looking at buffer settings, you can actually change a buffer setting as well to change the amount of area sprayed. And so he's going to look at it from a residual standpoint to see if that does improve. If you are going to single tank, apply your residuals through the targeted boom.

**[26:52] Jason Norsworthy**

So I'm going to stop you there and just again because our listeners may, when you say buffer setting what are you talking about?

**[27:00] Tristen Avent**

So buffer settings are essentially how long is it going to keep a nozzle on or is it going to activate more nozzles than needed to contribute to that weed. So the weed might be a foot in diameter, but that's a big weed. But it's going to treat that weed as if it's three feet in diameter. And so it's going to trigger more nozzles and leave the nozzles on for a longer distance spraying more area. So that's one thing that you can change. Another thing that we've seen is narrowing your nozzle angle. So I don't know what the most common nozzles are. So I'm going to talk in TeeJet terms We have 110 degree nozzle. It's going to trigger more nozzles with 110 degree nozzle. Let's say we go down to an 80 degree. It's going to

trigger fewer nozzles. You cut it down to a 65 degree. It's going to cut on fewer nozzles. Also, another thing, too, that can drive savings. The higher your boom is, the more nozzles it turns on, the more accurately placed your boom is, the more closer to that recommended height, the fewer it's going to turn on. And then Dr. Scott looked like you had a question?

**[28:10] Bob Scott**

Yeah, well, and I'm going to throw this one to Dr. Noseworthy. I recently went to a meeting at the EPA to talk about a different kind of buffer buffers around protected areas and areas of concern for the Endangered Species Act. But there's a whole lot of talk right now about mitigation when it comes to reregistration. And I can't help but think as we talk about only spraying where the weeds are and conserving the amount of chemical that is actually going out into the environment. I mean, will this not could this not have some implication on reregistration and mitigation of some of the risk of some of these products?

**[28:53] Jason Norsworthy**

You know, it does. I think there's a there's a lot of talk right now around targeted sprays. And when you look at mitigation strategies, there's generally going to be there's going to be a pick list for most herbicides as it relates to mitigation strategies. In some scenarios, you may have to have 1 to 3, etc. of the strategies that you're actually picking from to mitigate the risk associated with a given pesticide. And yes, I do think I do think that we can use targeted sprays. I'm extremely hopeful that the agency will view targeted sprays as a way of minimizing exposure off target movement of a given pesticide. I know that we've done some work not only quantifying sprayed area but just quantifying off target movement. And what we have found is we can substantially substantially reduce off target movement of a pesticide with a targeted spray, especially in a scenario, like I said, where you're you have a substantial reduction in the area treated within a given field. So with that, any other any other questions? Dr. Scott.

**[30:15] Bob Scott**

No, I just I want to let people know that a lot of the research that I present at county meetings and a lot of the work that we do comes through these students. And I'm glad we're taking the time to get to know them. And I'm glad we're doing this for me because I don't know a lot of these guys, they weren't around when I got out of weed science for a while now I'm back. And so I'm getting actually to hear about all this new research and hopefully we can do this again.

**[30:44] Jason Norsworthy**

Well, I'm looking forward to doing it again with some other students. And like I said before, we close any of the comments from you two Tristin, Lane, any other final thoughts?

**[30:56] Tristen Avent**

Just thank you for having us. Appreciate your taking the time letting us come on the podcast, talk a little bit about our work and we look forward to presenting our results to to the producers hopefully here soon.

**[31:07] Jason Norsworthy**

So yeah, so I look forward to having the two of you and the Arkansas Crop Management Conference coming up end of November, first week of December. I don't have the date here in front of me, but the

two of you will be speaking at that meeting. And as you just mentioned, as Dr. Scott there mentioned, a large portion of what these guys are doing ends up in our county meetings, ends up in our production meetings. And I'm just thankful to have the two of you as part of the program. I really appreciate what you contribute to this program. With that, I want to thank our listeners for joining us for this episode of The Weeds AR Wild podcast series on the Arkansas Row Crops Radio.

**[31:53] Intro/Outro**

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