



## **Episode 11—Understanding Nematodes, May 13, 2021**

Announcer:

The Alabama Crops Report Podcast, your trusted information source for Alabama agriculture.

Dr. Scott Graham:

Hey everybody, welcome to another episode of the Alabama Crops Report Podcast. I'm extension entomologist Dr. Scott Graham.

Dr. Amanda Scherer:

And I'm extension plant pathologist, Dr. Amanda Scherer, and we are excited to be releasing regularly scheduled podcast episodes with up-to-date information about Alabama crops throughout the year. You'll be hearing from extension personnel from all over the state with the latest research and management recommendations. How are you doing today, Scott?

Dr. Scott Graham:

I'm doing pretty good. How about you, Amanda?

Dr. Amanda Scherer:

I'm doing good. Got my first set of trials in the ground. Got a cotton trial at PBU last week and a peanut trial in Hedland yesterday before the rains came in.

Dr. Scott Graham:

Yeah, yeah, as we record, we're kind of dodging rains here, there and yonder across the state trying to go where they're not so we can get some stuff done in the field. All right. We're excited about our guest today. We have Dr. Kathy Lawrence who's an alumni professor and the Joe Klepper-endowed professor here in the department of entomology and plant pathology at Auburn. Didn't know this until today, she was actually hired as the soil borne and foliar disease plant pathologist of crops in Alabama, but has since kind of moved to the resident nematologist. Kathy, how you doing?

Dr. Kathy Lawrence:

Good. Thank you for... I enjoyed being here. I appreciate it.

Dr. Amanda Scherer:

Yeah, we're really excited to have you on today. We've recently had some small farm producer visits and a meeting with some Alabama crop consultants and actually one of the biggest things they asked me, "Well, is it is Kathy Lawrence still working on nematodes?" And you know, just wanted to know some of your research and that. So it's kind of a perfect time to have you on the podcast. So we'll just kind of jump into some of those nematode-related questions. So what are some of the main nematode species or populations that are here in the state of Alabama that caused such big economic damage to crops?

Dr. Kathy Lawrence:

In Alabama our major nematodes are the root knot nematode and I don't know if you want to know it, *Meloidogyne incognita* is the scientific name, but that's our Southern cotton nematode and that's one of our main ones. It does like all the sandy soil. So I find it most often in the southern part of the state. The reniform nematode, *Rotylenchulus reniformis*, a nice name, it rolls off your tongue, it's more of a silty soil type of nematode. So that ones most often up north, but there is a place in the southern area near Atmore where there's a hotspot of those nematodes too.

So those are the two big ones that we have, although there's lots of little ones that show up we see a lot too. So in corn nowadays, and we planted a little early and it's nice and cool, like it showed up and wet this year, we had the stubby-root that's been showing up so that one's been common and a few lesions have been causing some damage too. So those have been some newer ones.

Dr. Scott Graham:

In general, do you see different above ground symptoms from the various below actual nematodes? So the cotton does it show different stresses?

Dr. Kathy Lawrence:

In above ground, no. Below ground, the root knot will give us some nice galls, the reniform won't. But truly our best symptom we have is yield loss.

Dr. Scott Graham:

Yield loss.

Dr. Kathy Lawrence:

That's not exactly a visual that you can identify.

Dr. Scott Graham:

Too late.

Dr. Kathy Lawrence:

Yeah, it's too late, exactly.

Dr. Amanda Scherer:

Yeah. Because of the symptoms can be kind of nondescript, the above ground symptoms where it'll just be stunted, kind of unhealthy looking plants. So then you don't know, okay, is it a fertility issue or is it some other disease or is it nematode pressure? So yeah, it's definitely a challenge if you're just going based on the above ground symptoms, for sure.

Dr. Kathy Lawrence:

That's exactly right. It's so difficult to figure it out. So when they call me, it's usually yield losses continue to get worse.

Dr. Scott Graham:

Yeah. You know, one of the questions that I get a lot as an entomologist is, "Is the weather going to mean we're going to have less bugs or more bugs in this year?" And the answer is probably not, but maybe, yeah. Do you think environmental conditions do anything for nematodes or they're so low in the ground, my guess again will be probably not, but...

Dr. Kathy Lawrence:

Yeah, the cold weather doesn't seem to bother them. So I know when we get so many freezing days, we hope for less insects.

Dr. Scott Graham:

Yeah.

Dr. Kathy Lawrence:

Hasn't bothered the nematodes so far. Now wet weather, the nematodes like this moisture. They're so happy. When we have a dry year, I can't hardly find them. But when we had last year, it was such a nice moist year, they were everywhere.

Dr. Scott Graham:

Now you sounded a little bit more excited about the wet weather [crosstalk 00:04:32].

Dr. Kathy Lawrence:

There were nematodes everywhere to be found, which is not great for the growers, but it was easy to do tests out there.

Dr. Scott Graham:

Yeah. That's when we learn the most is in high pressure situations.

Dr. Kathy Lawrence:

That's true.

Dr. Amanda Scherer:

Since we've kind of talked about soil type and their effect on different nematode populations that you see and also the soil moisture, for control, what can producers do in terms of crop rotations to help minimize some of those pests, especially in heavy pressure areas?

Dr. Kathy Lawrence:

And that's the best thing they can ever do is the rotation of their crops. So our reniform nematode does not go to corn and there are resistant soybeans and it doesn't go to peanuts. So there's other crops, if you can rotate to any of those others, that helps tremendously. The root knot nematode does go to a lot of other crops, but the southern root knot that attacks cotton does not attack peanut. So that's an ideal rotation. Grain sorghums are iffy. So it depends on the variety. So we need to read those bags if we're doing something like that. So we've also done some winter crops and the wheat and the rye and the barley, it depends on the variety. So we need to read those bags to see who's a host and who's not a good or bad host on that part.

Dr. Scott Graham:

One question I have when you're going there is, is there a certain amount of time we need to move out of cotton before we... You know, if we move to peanuts, do we need to be in peanuts for one year, two years? Is one year enough?

Dr. Kathy Lawrence:

One year is good, two years better.

Dr. Scott Graham:

Okay. Okay.

Dr. Amanda Scherer:

And even in peanuts, we've seen where you have really heavy pressure of root knot nematodes, even if you go out to four years out, if you can, which most producers can't, you see it drop really dramatically, the longer you're rotated out of peanuts for nematode pressure.

Dr. Scott Graham:

Okay.

Dr. Amanda Scherer:

So yeah, one to two years, definitely.

Dr. Kathy Lawrence:

And the one thing that we should add to that is they need to keep it weed free at the same time. So in the corn, corn is the most difficult rotation because at the end, you're just letting it die down and dry out so you can harvest it. And if those morning glories and pigweeds show up then, they're a great host for those nematodes. So it's hard to keep that corn clean, but you really need to.

Dr. Scott Graham:

We won't tell our weed science colleagues, they get any credit at all.

Dr. Kathy Lawrence:

Okay, go it.

Dr. Scott Graham:

So what about, does tillage have any effect or?

Dr. Kathy Lawrence:

Yeah. And it depends on the nematode. So no, till in the northern area, you don't want to play it right back into that row because you're planting back into those roots where they were. So soil conservation, you have to make your choices.

Dr. Scott Graham:

Yeah. Yeah, the entomologists, we understand the positives of no till, but it does bring its own separate issues that we weren't used to dealing with.

Dr. Kathy Lawrence:

Exactly, yes.

Dr. Scott Graham:

Yeah. So we had Audrey Gamble on, the soil scientist, a couple of weeks ago and we talked about that a little bit.

Dr. Kathy Lawrence:

Yeah. The no till is really good for the soil, but sometimes it increases disease.

Dr. Amanda Scherer:

I know that in addition to crop rotation, variety selection can probably go the farthest on top of that.

Dr. Kathy Lawrence:

Absolutely.

Dr. Amanda Scherer:

So do you just kind of want to get a rough run down of some of the varieties that you've looked at for cotton or corn or soybean, and go with your best recommendations for producers?

Dr. Kathy Lawrence:

And we do thank, very much, to our Cotton Commission that always gives us some funding to put all the varieties out there. So last year we looked at PhytoGen 332... 322, I got to get my numbers straight, which is reniform resistant and it did very well at Tennessee Valley at our research station. So that one was very good.

There's also a PhytoGen 443, which is more of a longer season that we didn't test so far up north, but I haven't tested that one, but the 332 did really well. This year we also have asked Deltapine for 2141, so we'll put that in the test and we'll know by next year. There's a whole handful of root knot resistant ones. So we looked at 360 last year down at the plant breeding unit where we have so much root knot and it did pretty well, but we had a few hurricanes that kind of gave us some trouble there.

But there's a dozen of them that are different ones that are good for root knot resistance that are out there too. And they're PhytoGen and Deltapine and Stoneville so whichever one you want to pick, just look for that. Some of them will tell you whether they're one gene or two genes. So I always get the most genes. So there are quite a few out there to choose. And that variety is the major decision that they make.

Dr. Amanda Scherer:

Yeah and peanuts, it's a little bit simpler. There's really only three varieties that have resistant to root knot nematode. So that's your TifGuard, your TifNV and Georgia 14N but they're not resistant to lesion nematodes. It's only root knot. So there's not quite as much room to play with in peanuts, but there's definitely a lot to choose from in cotton.

Dr. Kathy Lawrence:

Yes, there's a lot more coming in and it's sad that way to where one nematode resistance doesn't give you resistance to all of them. That's the sad part. So you got to know exactly which ones. And for soybeans that's the same thing. So if we [inaudible 00:09:26] with the soybean variety, they'll tell you if it's reniform resistant, soybean cyst resistant or root knot resistant. So you have to know which nematode you have to match it to that soybean variety. And I've given up doing all the soybean variety trials because there's hundreds of them. [crosstalk 00:09:41] There's just so many it's hard to choose, yes.

Dr. Scott Graham:

I guess the only way to know what, I guess species, is that the proper term? Of nematodes you're dealing with would be to actually take soil samples and send them to either the soil testing lab here at Auburn or wherever else you might do it and they run an analysis on them, I guess?

Dr. Kathy Lawrence:

Yes. They can identify what's in the soil. They just do it to genera, but that's fine. That's enough for what we need to know.

Dr. Scott Graham:

Yeah.

Dr. Amanda Scherer:

So just to transition now that we've kind of covered nematodes, probably another big seedling issue is seedling diseases in cotton. And I know that sometimes nematode feeding can actually increase some of those diseases that you see for those soil borne pathogens because it gives them a route into the root system and this recent bout of cool, wet weather that we had, I would imagine any producers that had cotton in the ground might be concerned about that. So do you just want to go over some of the common fungal pathogens that we see attacking cotton seedlings?

Dr. Kathy Lawrence:

Sure. Yes. We are expecting this season to have a little bit of Pythium out there because that's one of those water molds that likes this nice wet, moist weather. So we're expecting that. Although across the state, I haven't ever found a shortage of the Rhizoctonia, which is our sorshin that seems to be your hot season, but it shows up everywhere too. So we have that one and we do up in the Northern areas, we've got some Thielaviopsis up

there, so that black root. And when you [inaudible 00:11:03] we plan a little early and we got some good Thielaviopsis islips, and fields that you can test those in. And fusarium is never at a loss in Alabama.

So those are the major four and they just basically cover the whole state. And I did plant the seedling disease trials two weeks ago, just looking for it. But gosh, this weather this last few nights has been some of the worst. So we'll see.

Dr. Amanda Scherer:

Yeah, that was one of my first cotton trials that went in the ground, was looking at the seedling treatments. So I'm assuming we're probably going to get some good pressure, so good for us.

Dr. Kathy Lawrence:

Yes, good for us. So we're testing those fungicides, we'll know what really is going to work, but most of the fungicides that come depend on the seed that you've picked out. So whichever brands you go with it comes with those.

Dr. Scott Graham:

And you know, that's one thing I've kind of noticed with insecticides and things. We have plenty of insecticide seed treatments, but there's also people who want to put out liquid in furrow sprays or granular in furrow applications. I know AgLogic or Altacor has got some nematode control as well. I guess control is a good word. Suppression, I'm not sure. Are there any liquid in furrow fungicides that people might consider or is it pretty much just what's on your seed for an actual seedling disease?

Dr. Kathy Lawrence:

We used to have some liquids that we sprayed in furrow and I know they still... Some growers do, but that the fluopyram, which is our new vellum is a fungicide. So it's used both directions. So it's going to give you a benefit both ways if you want to do an in furrow spray. So there were quite a few, but they all tended to move to the seed treatments because it's just faster to get all of everything planted when we do get an opportunity with this rain.

Dr. Scott Graham:

Yeah. You don't have to worry about calibrating and things like that.

Dr. Kathy Lawrence:

Right, it's done.

Dr. Scott Graham:

You just load it up-

Dr. Kathy Lawrence:

And you can move out.

Dr. Scott Graham:

... and hit the road.

Dr. Kathy Lawrence:

Yes.

Dr. Amanda Scherer:

So just keeping on the topic of seed treatments and different fungicides, some of them work really well against Rhizoctonia, which you've mentioned, but I think there's only one that really works well with Pythium. Do you want to talk about some of the differences with some of those seed treatments?

Dr. Kathy Lawrence:

And Pythium is just one, what we used to call a lower fungi. Now it's in a different classification, but there's different fungicides that work well on the Pythiums and different ones that work well on the fusariums as the rhizoc, so usually we're looking at a blend on our seed treatments. So any protection that we can do for that seed to make sure we get up a healthy crop, always helps for the yield at the end. So that's so much that's added to the seed that I wouldn't skip that. Along with the insecticides and a little nematicide and there are some other growth promotions that can be added that can help quite a bit too.

Dr. Scott Graham:

Now, I guess kind of the unfortunate thing is it's not like insects where we have thresholds and we can spray if we need to. Really, if you get a seedling disease issue, there's not much you can do, right?

Dr. Kathy Lawrence:

Prevention. That's what we do. Prevention is 90% of what we do. Yup, if you want to bring up that healthy crop. I think a long time ago, we called it the first 40 days of a healthy crop and you've made it. I don't know if they still say that, but just bringing up the healthy crops, so I'm adding as many things as I can in the beginning just to make sure we start off so that then we can start working on the insects. We've got to have something to protect begin with.

Dr. Scott Graham:

Right. That's right. It was all about trying to get a good start.

Dr. Kathy Lawrence:

Mm-hmm (affirmative), absolutely.

Dr. Scott Graham:

Absolutely. All right. Well, Dr. Kathy Lawrence, we sure do appreciate your time today. We know you're busy and got a lot going on, but we feel like we learned a lot here today and appreciate you taking time out to visit with us.

Dr. Kathy Lawrence:

Oh, thank you for inviting me. This has been fun. I appreciate it.

Dr. Amanda Scherer:

Yeah, definitely enjoyed it.

Dr. Kathy Lawrence:

Yes, very much. Thank you.

Dr. Scott Graham:

All right. Well, be looking out for another exciting episode of the Alabama Crops Report Podcast coming soon.

Announcer:

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