Season 2 Episode 10 – Using Drones in Crop Production

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Speaker 1:

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

Katelyn Kesheimer:

Hello, and welcome to another episode of the Alabama Crops Report podcast. I am one of your hosts, Katelyn Kesheimer.

Dr. Amanda Scherer:

And I'm your other host, Dr. Amanda Scherer. I'm an Extension Plant Pathologist. So Katelyn, how are you doing? I mean, it's busy out there. It's in the heart of field season.

Katelyn Kesheimer:

It's hot and it's busy and there's lots of insect activity, so I'm not bored, but lots of bugs out there. And lots of rain, specifically in the southern part of the state. And here we are with one of our regional extension agents for a first time guest on the podcast. Welcome to G. Morata from the southwest region, who is on our Agronomic Crops team.

Guilherme Morata:

Yeah. Thank you so much for having me today and that's my first time, and I'm very glad to be here today.

Katelyn Kesheimer:

Well, welcome. And we are not in the studio today. We are looking at you on Zoom, because you're a few hours from main campus, but I'm really excited for our topic today. We're going to talk about the use of drones in crop production. And G., this is something you've been really working on this year.

Guilherme Morata:

Yeah, so we got three different grants to work with drone this year. So we are looking on how we can use the drones on cotton, corn, and soybeans this year. So I have been working with these three crops throughout the whole growing season, and we are having a very good experience in telling farmers how they can use drones today to help them to manage better the fields.

Katelyn Kesheimer:

So G., what all can you actually use drones for? I think a lot of people hear about drones even in video games or in military usage, but how can you employ those in agriculture and what are you doing specifically in your area in those crops?

Guilherme Morata:

Yeah, absolutely. In the past, most of people bought drone. I have several farmers that said, "I have a drone," and they use the drones only to take pictures and videos. But the real good stuff on using drone is using special cameras where you can have infrared and near infrared to calculate NDVI, which is just a vegetation index. This is how I tell growers that the magic begins because NDVI can capture problems that our eyes can't see. So we move from taking pictures and videos to coming up with maps that help farmers to understand where they might have a problem, and crop consultants, agronomists, can go and scout the field and be more accurate, find what is causing these problems in the field. So this is one of the main use right now.

But we are also doing very new thing, which is called the stand count. And that is helping us a lot to have a whole picture of our final crop stand after planting. So I have been in a lot of discussions with farmers and we actually had a few day last week here in Fairhope. And I asked growers when they used to go and tell for final crop stand, how many locations they used to do that? So most of the farmers said, "Well, I used to do 3, 4, 5 locations in the field." I count the population. I count the plants to come up with the final population.

And I did a very fun math for them. And if you go to your field to do a 10 count and you select 10 different places and you count 10 feet, you count the number of plants in 10 feet. So let's imagine 10 locations, 10 feet. And we are talking about a crop on 38 inches row spacing. And the field has 50 acres. The farmer doing that is only counting 0.01% of the whole field. So it's something, but it's still very far if you want to have a very accurate 10 count. So with the drones today, you can do a 50 acre fielding, 30 minutes, plus 15 minutes to process the image, and you can have the whole stand count for the field. So stand count can be used for replanting decisions or also to understand why you are having bad crop population in some areas of the field and how can we improve that, and perhaps changing nitrogen management. So that's one of another very good thing that we are doing with the drones and farmers are getting very excited with their results.

Katelyn Kesheimer:

That's great to hear. And from my entomology and IPM background, to me, this just sounds like another tool in the toolbox we can use to really maximize our yield and profitability. But from my perspective, it sounds like you are a drone specialist, G. You are up to date on all the models and technology and how to use them, but can you rewind a little bit and talk to us about your background in agriculture and extension and how you got to this place where you are a drone expert and working on three different projects here in the state?

Guilherme Morata:

Absolutely. Yes. So I am an agronomist. I graduated back in Brazil in 2013. So I had five to six years of experience working with private industry back in Brazil, before I moved to Auburn. And then back in 2018, I came to Auburn to do my master's degree with Dr. Ortiz, and the master's degree was with Precision Ag. So that's when I started to develop this passion about drones.

Back in 2018, I was using more satellite images, but when I moved to southwest, we have a lot of rain here. And most of our days we have clouds. So we kind of said, "Well, we can't use satellites anymore." So I started diving into the drone world. I started to see a lot of benefits. I'm a very big fan of technologies. So since I was in Brazil and since my bachelor's, I was always working Precision Ag. So I knew that drone was something very new. And I was like, "Well, there's a big opportunity here right now to work with that."

In 2020, I start as the Region Extension Agent here in southwest. And then I said, "Well, now I have the opportunity to bring drones to this area and start to help farmers using those technologies."

Dr. Amanda Scherer:

Yeah, G., and we're definitely glad to have you on the team and have your expertise and drones with us. And just from my perspective and how I can visualize how producers will find it useful, I mean, you mentioned it rains a lot, especially in your part of the state, and I've done stand counts on my own plots. And it takes me just small little 25 foot plots, maybe 18 treatments, four reps. It takes me a good hour to do that. And sometimes with the rain, it's hard to get in parts of those fields. And so for producers really that utilize this technology and cut down on some of that time and get a whole field picture can be really helpful. Especially, as you mentioned, when trying to decide about replanting decisions or nutrient management. I've seen some really neat pictures from Steve Lee's program, our weed specialist for agronomic crops. And he's able to identify problematic areas even with nematode pressure or something else going on. So I think it will help producers focus in on certain areas.

So in terms of just crop management, what are the different, I don't know, the proper term, but different pictures that you need to identify different areas that you might want to look at? Are there different filters for the drone images?

Guilherme Morata:

So for stand count, it's the normal RGB camera. So it's the normal camera that most of the drones have. And it's like the phone camera. It's very simple, but when we're looking for NDVI, then we start to look on special cameras, and we have several companies selling different cameras because we need to have infrared to calculate those NDVI indexes, but we have a lot of company selling. And so those cameras, we are going to have to have a software to process the images. And the software that I'm using right now is, it's very good and it's very fast. So if I fly a 50 field, I would say in two hours, I can have the map, but we can also have a quick map, which this software provides us. It's a very fast stitching of images. What we are doing, we are taking 500 pictures in a field and combine those 500 pictures in only one. So we are having a very good accuracy in terms of one inch per pixel, which is a very accurate and a very good resolution of the picture.

So with this quick stitching, we can also have an idea in the field and you don't have internet to do that, this stitching of pictures. So the crop consultant or the region extension agent, or the farmer, can fly, put this offline in a red identify areas where you have a problem. So this is basically the main, what I call precision scouting. A lot of growers ask me if the drones will get in the place of the crop consultant. And I think the answer is not right now. It's just helping the crop consultant to be more accurate and not just walk randomly in the field trying to find bad spots. That's the camera that we are using. We are using a very common drawing, the Phantom 4, with the NDVI camera. So that's basically enough for growers to start if you want to do stand counts and precisions counting with the drone.

Katelyn Kesheimer:

You mentioned a couple different components of the drone. If I heard you correctly, you had the drone itself, the camera, and the software to stitch together and process all these images. What are we looking at for cost for any or all of these components?

Guilherme Morata:

So a normal Phantom 4, you can find for a very reasonable price. But when you start to add, and the Phantom 4 will come with the RGB camera, but when you're adding those NDVI camera plus software, which you pay a fee per year, we are talking about close to $7,000 for this whole pack with two cameras, one year of free stitching, so you can do as many acres as you desire. So we are talking about close to $7,000. But that are several types of drones in the market. We are talking about the Phantom 4, but we have fixed wings. We have a small drone, this is smaller than Phantom 4, with only RGB camera. So we can find drones for a thousand dollars and we can find drones up to $35,000. So that's basically like, whatever fits into the farmer operate. If you're a larger farmer and you have to fly a lot of acres, a fixed wing might fit better than a Phantom 4 because you can cover more area in less time.

Katelyn Kesheimer:

So G., you may or may not know this, but I know that there are some regulations when it comes to drones and drone flights. Do you have any advice to producers that are thinking about incorporating this technology on their farm?

Guilherme Morata:

Yes, you have, first of all, when you buy the drone, you have to register. But for flying purpose, you do need to have a license for flying the drone. It's a test that you can take called part 107. So you need to go and get a test to be able to fly. Special crop consultants and like Region Extension Agents that want to provide the service to farmers, you do need to have a license to be able to fly the drones.

Katelyn Kesheimer:

So as we wind down, G. and Amanda, I want to talk about how growers in Alabama can maybe get the opportunity to get some drone images of their farm from UG. And it sounds like you're offering free drone flights to growers in the state of Alabama?

Guilherme Morata:

Yeah, absolutely. So the flights are a hundred percent free, and if you are interested anywhere in the whole state of Alabama, you can just call your REA and schedule with team a visit, or you can contact me directly. You can find my information ACES' website, or you can just give me a call on 334-332-0094 anytime.

Katelyn Kesheimer:

Thanks so much. This is a great opportunity for growers to really see what they're getting with this technology and maybe the applicability on their own farm. And so any parting thoughts on drone technology, Amanda, that we want to end with today?

Dr. Amanda Scherer:

No, I think G. did a great job covering it. I've learned a lot. I knew a little bit about drones, but it's nice to know that G. is out there and able to help producers with this technology. We've really enjoyed having you on the podcast, Guilherme, and if before we go, do you have any parting wisdom that you want to share with our growers and listeners?

Guilherme Morata:

Yeah. I just want to say that this year has been a very tough year, especially in cost and weather, but most this year I've seen that drone can help us way more than we think. We are having very good feedback from growers from southwest. And I would love to expand the same feedbacks that I'm having here for the whole state. So yes, don't hesitate and contact me if you want to see better or different ways to manage your crop and how we can improve Crop EU together.

Katelyn Kesheimer:

Great. Thank you so much. And thanks to my co-host Dr. Scherer and G. for joining us on the Alabama Crops Report podcast. And if we have any questions or we can be of any help, please don't hesitate to contact us. Thanks.

Speaker 1:

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