The Southern Fruitcast

Episode 3: Strawberry Cultivar Selection and NC State Small Fruit Breeding with Gina Fernandez

[Intro] Thanks for tuning into the Southern Fruitcast. This podcast aims to cover the people, technology, and latest developments in small fruit production in the Southeast. We were brought to you by the Southern Region Small Fruit Consortium and the University of Arkansas System Division of Agriculture.

[Cato] I am Dr. Aaron Cato, Extension Specialist for Commercial Fruit and Vegetable IPM at the University of Arkansas.

[McWhirt] And I'm Dr. Amanda McWhirt, Extension Production Specialist for Fruits and Vegetables at the University of Arkansas.

[Cato] So today on the podcast, we have with us Dr. Gina Fernandez. Gina is a professor of horticulture at North Carolina State University. She leads strawberry, blackberry, and raspberry breeding programs at NC State and conducts research and extension. Her breeding program seeks to identify strawberry cultivars with disease tolerance and improve traits in raspberry cultivars with heat tolerance for the Southeast.

[McWhirt] Gina, thanks so much for joining us here today on the podcast.

[Fernandez] Hey, thanks, Amanda and Aaron. Glad to be here.

[McWhirt] So, Gina, your strawberry breeding program recently released two new cultivars called Rocco and Liz. Can you tell us a little bit more about both of those cultivars?

[Fernandez] Sure. Sure, I'd be happy to. So Rocco is an early season cultivar. It comes in about the same time as Sweet Charlie, so it's a good one to start off your season with. It has excellent flavor and really, really nice flavor. Fairly good yields, higher yields than a Sweet Charlie does. And it just keeps going all through the season so it doesn't really die off like Sweet Charlie or level off less Sweet Charlie does. It's a shiny berry, so it has a really nice, attractive look to it. And then it also is moderately firm, we say. So that's a nice way of saying it's not going to be a one that you ship, but it's a nice one for pick your own type of situations and where you really want to get, you know, your season off

early. So it's not a shipper, but it's best for local markets and we kind of consider it as a Sweet Charlie alternative.

[McWhirt] Tell us a little bit about Liz.

[Fernandez] So Liz is a nice one too. So we release some both at the same time, and Liz is named after another technician. It ripens a little bit later than Rocco about a week later. So it comes in in the main season with Camarosa and Chandler. It has a really high yield, and that's sort of its most outstanding characteristics. It just keeps going when everything else peaks, it really peaks out. So it really has a good yield. Its flavor is okay. It's not as good as Rocco is, but it's at a consistent yield. And what we what we see with that is it really is a consistent yielder. So sometimes some cultivars won't yield as well in some years than other years. Camarosa, it has to, you know, if it has a cold winter, then it doesn't yield as well. But this is Liz is just as very consistent from year to year, and it always just has a nice high yield. So it's a consistent one. And we kind of think of this one as an alternative to Camarosa. So, you know, we have an alternative to Sweet Charlie and an alternate to the Camarosa with those two new releases from our program.

[McWhirt] Okay, great. Do you have any comments on specific management that may be required for either of those cultivars, whether it's, you know, fertility, planting date, or something else like that?

[Fernandez] Yeah. So this year we actually had a little experience with that. We planted Rocco maybe two weeks later than usual just to see what would happen with that one, because we thought maybe we could get bigger fruit and we decided that's not the thing to do with Rocco. So, you know, what we're going on right now is just treat it like you have treated all your other cultivars, you know, Chandlers and your Camarosa and once we get a better handle on the, you know, the specifics of these two different cultivars, we might know a little bit more, but don't plant them late. That's what we know for so far.

[McWhirt] Yeah, great. That's good to know.

[Cato] Yeah, I think that we are pretty excited to have those two variety or new cultivars in the test that we did this year. And I think Rocco was the one that came on real early compared to the other cultivars and I think it was the favorite of flavor wise.

[McWhirt] Yes, we did kind of an informal taste test just among employees at the vegetable research station in Kibler, Arkansas. And Rocco was one of the top ones as far as flavor. People were really impressed with flavor and excited, particularly because it

did come off early, you know, especially at the vegetable station, they're used to not having as much fresh fruit. And so they were excited to have that one come out early and kind of start off the season.

[Fernandez] It's a nice way to get your season off early is like, Oh, that's a nice strawberry. So, you know, is really a good way to kick off your strawberry season.

[Cato] And we had one grower that grew Rocco, right?

[McWhirt] Yeah. And we've had a couple of growers here in Arkansas who are starting to try Rocco, and we're excited about it. And, you know, did try it because it was an alternative for Sweet Charlie. And we're looking for something with higher yields and I think are going to continue to try it. We also had Liz at our station and I don't know if you remember, Aaron, that one day we went out there and, you know, it did come off later, but there was a couple of plots that were just absolutely loaded with fruit and so we're excited to hopefully get some of our growers here in Arkansas to try that next year and give us some feedback. But yeah, we were impressed with the yields on Liz for sure.

[Fernandez] Yeah. So you got, you caught the salient traits on both of those. Yeah.

[Laughs]

[Cato] So for these two cultivars, have you seen anything in differences in disease tolerance? I know you are doing a little work in that area. Is there anything - observations you'd like to share?

[Fernandez] We don't expect them to be any more disease tolerant than anything else out there right now. This is some of the germplasm that I inherited from the previous breeder. So we just wanted to get that stuff out there. We are focusing now on disease resistance. And we we're looking at in particular at anthracnose resistance, both fruit resistance and crown resistance to the different pathogens, the anthracnose pathogens. So give us a couple more years and we might have something out there. But right now we're looking at doing some of the lab stuff and screening materials in the fields for those two diseases that we think are quite devastating to strawberry growers in the southeast.

[Cato] Okay. Are there any, like growth characteristics that you are looking for? I noticed that. I think with Rocco and Liz, they're both pretty upright growing compared to some of the other cultivars. Maybe I missed or misremembering, but it seemed like they were pretty upright compared to some of the other ones. Do you think that that plays any role at all?

[Fernandez] Absolutely, yeah. So you have better air circulation through that canopy and and you're able to see the fruit a little bit better, too. So we do like that, that characteristic. Interesting. My post-doc and my technician, Rocco, we're out in the field and my postdoc always likes that upright growth habit. He always selected. And when you see something, he gets excited about the upper growth habit. So between the three of us, we're really capturing some of those unique traits. I like big fruit and tasty fruit. So – and Rocco likes a healthy plant. So, you know, the combination of us three going out there and looking at plants, we feel like we're getting a good combination of traits.

[Cato] Gotcha. But, you know, and that's one thing me and Amanda were talking about a lot. We were just kind of walking there and observing them. As you know, we were trying to think of a strawberry cultivar. You know, in Arkansas. We have a lot less of the intense production like you guys do there in North Carolina. I think it kind of varies. But as you get into the true Southeast, these is what we like to call it. You know, we're up here shaking hands with the Midwest. It's a little different. We see a lot more of this more intensive production. But here we have a lot of people that are more minimally growing their strawberries. Any by minimally, I mean, from my point of view, they're just not putting much input into it. And so what cultivar do you think that you've looked at would thrive in some system like that? So maybe organic systems, but also just maybe even a minimal input conventional system.

[Fernandez] Yeah. So, you know, so Sweet Charlie has some disease resistance, we feel so that one might do a little bit better. You know, all the other standard cultivars that are out there right now, they've all got some susceptibility. Some of this newer stuff coming out of the Florida and California, they have some potential. Just don't have a really good handle on it right now. So yeah I would stick with probably Sweet Charlie. Interesting we've had, we do strawberry gardens in the schools and they've grown Camarosa and Chandler in every year and at the elementary schools and high schools and they don't have any problems with that either. So, you know, with if you're sort of isolated from everything else and you're not in big production, you don't tend to have as many problems I've seen in that situation anyways.

[Cato] Yeah, I think we see something similar. It's kind of funny for us because we speak talk of a large variety of size growers, you know, pretty big growers and really small ones. And the small ones always like to tell us, like, I don't have very many issues of my strawberries, but I, -

[Fernandez] You know, some of that's beginner's luck and some of it is being isolated, I think.

[Cato] Right.

[Fernandez] You know, the weather and stuff.

[Cato] Yeah. But it's good to hear that y'all are working on anthracnose now, specifically because we sent in some samples this year. And I don't know if we've really done any resistance testing over here in Arkansas, but this year we got back samples that indicated we had resistance to the QOI fungicides. And there's just not many options out there. So I'm glad that your direction is in, you know, plant resistance or tolerance because I don't know that there's a good fungicide that we're going to rely on besides Captan as the, you know, that old standard for it.

[Fernandez] So, you know, it would take that a little bit further. We're actually looking at hemibiotrophic resistance, which is a mouthful, but we call it the hidden enemy – and are you plant pathologist, Aaron?

[Cato] I'm an entomologist, but I try.

[Fernandez] It's a disease that is in the plant, is hidden in the plant. It's in a like a quiescent stage. And we are we have found some molecular markers. We're developing some molecular markers where we feel that we have some resistance to both the fruit anthracnose and the root - the crown anthracnose in this hemibiotrophic stage. So plants often go through the nursery, have this disease, and then they get moved into the field. And, you know, that disease just breaks out once it gets into the nice, humid atmosphere in the nursery where you have the overhead irrigation and it's hot and humid. So but we feel like we're, you know, we're working on that that stage that's not able to be seen in the plants or in the nurseries. So we we're really excited about that.

[McWhirt] That's great. So you also work on blackberry and raspberry, so we want to ask you a little bit about those crops as well. Can you talk a little bit about what you're working on with regards to primocane fruiting blackberry and nutrition testing?

[Fernandez] Sure. So blackberries, as you guys know, they used to come in just floricane fruiting. So it had a biennial growth habits habit. So you would only have fruit production on the floricanes once a year. Well, thanks to our friend, your friend, John Clark, we now have primocane fruiting blackberries, which can produce a crop on the primocanes, the first-year canes, and the second-year canes. So when those prime, those plants are producing fruit, both on the primocanes and the floricanes, that they're in competition with one another and the nutritional needs are going to be different than one another. So what we all know what your recommendations are and what our recommendations are in North Carolina are, you know, just based on what we know for

floricane fruiting. So we went through and took leaf samples from two different cultivars, Traveler and Prime-ARK 45 over two years at two on farm locations. And just every 2 to 3 weeks sampled those leaves, sent them into our nutrition clinic, Department of Agriculture, to get feedback on that. Whatever the nutrition nutrients were in the in the leaf tissue. Nitrogen, potassium, etc. I think we had ten different nutrients that we looked at to see what, you know, what the differences were. And we had a, we had a single cropping planting and then also a double cropping planting. So we had two cultivars that were singly with just primocane fruit crop or one that had a primocane and floricane fruiting crop. So we looked at all that data and we're still kind of scratching our heads trying to figure out what's going on. But we feel that there certainly is more competition when you have both primocanes and floricanes out there, especially with calcium, which seems to be very fluid situation there. And then also when the tipping occurs too, we see some little blips in the calcium levels too. So we're looking at that a little bit more clearly or more closely. And we just got the data back earlier this spring about two years. So we're kind of sorting through all that. And then one of the things that we know that we have to do is move the recommendations of when to take samples probably back a little bit. Right now, what we see in North Carolina is you take your sample about ten days after your floricane crop has finished producing fruit. We think we need to back that up into like either the flowering stage of the primocanes or the green/red fruit stage. So we capture more of what that plant needs this season in addition to the next season as well. So that's something that we're pretty sure that we're going to need to do with that.

[Fernandez] And the other thing, I guess kind of the big take home on that one is that each cultivar is going to be different too with the Prime-Ark 45 we looked at and Traveler so we're seeing differences on how they respond to fertility quite a bit. So that's something to look forward to trying to sort through all that.

[McWhirt] Yeah, that's great. That's going to be some really important information, especially for growers who are trying to do the double cropping. I know even in this season it seems like we're seeing some interesting things going on with fertility on blackberries where it seems like there might be some deficiencies popping up. I'm not entirely sure why, but possibly due to just kind of a longer season with things breaking bud earlier, have you seen anything like that out in North Carolina this season, Gina?

[Fernandez] Oh, you mean as far as the season changing or –

[McWhirt] Just weird nutritional things on blackberries?

[Fernandez] We are, so actually that we haven't seen some leaf color, off type colors that I haven't seen before. So we're not sure if it's a phosphorus thing or a nitrogen thing. So. And that one was on Osage we're having trouble with I don't know if you guys are seeing that or not or not, but Osage seems to be very sensitive where everything else in the field is responds normally and Osage seems to be a little bit off. It's got some reddening in the leaves. So we're trying to figure out scratching our heads, trying to figure out what's going on with that one.

[McWhirt] Yeah, the whole fertility, you know, that component of blackberry, really any fruit crop management is pretty difficult with particularly on a blackberry crop where you're, you know, feeding this year canes that are going to be producing for next year. So it's hard to know what's going on sometimes.

[Fernandez] Exactly. You know, we yeah, you know, they have that double crop. So they need to be fed this year, but they also need to be fed for next year. It's a tricky balance there.

[McWhirt] Absolutely. Well, I think we're going to wrap up with one more question. So you have your strawberry hat, your blackberry hat, and then you also have your raspberry hat. Do you have any updates for us on the raspberry breeding program?

[Fernandez] Sure. You know, so that's kind of number my number 3 child, but it's actually my favorite child. Don't tell anybody, you know, raspberries are just, you know, delightful when they when they're in season. And since I took over the strawberry breeding program a few years ago, I have not been able to spend as much time and not developing a lot of crosses. But I do have some material out in the field that's looking really nice. We have, you know, I think we have more heat tolerance in in the cultivars and we are propagating some stuff. I'm going to put them up in the mountains still because we feel like they'll probably be more productive out up in the mountains. And it's just hard to harvest raspberries in the middle of the summer. They're just so delicate. But up in the mountains here, you know, we have some fairly high elevation and we're going to test them up there. And we think that we can probably we have some interesting things coming along. So I'm hoping to, in the next few years, have more to say about that. But raspberries really are quite lovely and they're looking pretty good.

[McWhirt] That's exciting. We'll definitely stay tuned there. I know we get a lot of questions of growers interested in cultivars that would do or be more successful here in the Southeast. So I'm sure a lot of our listeners would also be excited to hear any releases you might have coming up in the future.

[Cato] That's good because they're planting raspberries either way. And so it would be nice to have something good for them to plant.

[Fernandez] So Dorman Red, you know, Dorman Red, Dorman Red, Dorman Red is the one that is heat tolerant. So that's one that you can always go back to and say, plant that one.

[Cato] Good. Okay. Well, I think that wraps up all the questions we had, Gina, and we appreciate you coming on and talking. We know we wanted to have you on to talk about these strawberry cultivars, especially because, you know, a lot of people in the southeast are trying to figure out what they're going to grow for next year. And I know we had a lot of excitement and just questions about some of the different varieties of different cultivars coming out of NC State, because I think they understand that you've got a good product coming that way. So –

[Fernandez] Hey, so I got one more to push too. So we've got a blackberry called Von V-O-N and it's really a nice blackberry too. I don't have anything else really in the pipeline, but we released that in kind of because it was looking good and it's a nice late season blackberry, too. So I don't know. You know, it's hard to compete with the University of Arkansas breeding materials, but it's something that somebody your growers should consider as well, especially in the late season.

[Cato] What cultivar would you say it compares to with harvest time? I think that would be the question we would get from growers.

[Fernandez] Is the Navaho kind of alternative is in that same window and it's resistant to orange rust. So, you know, we have lots of trouble with Navaho and orange rust, but this Von is just really clean. So it's it's a nice it fits into a good window for us and then stays healthy, too.

[Cato] It's good to hear because that would be the next question we would have from a grower about it.

[Fernandez] I actually had that - you were supposed to ask me that, but I forgot to tell you so.

[McWhirt] All right, Gina, well, we really appreciate you joining us here on the Southern Fruitcast. We look forward to talking to you again in the future.

[Fernandez] Sounds good. Thanks, guys.

[Out – Cato] Thanks for tuning in to the Southern Fruitcast. Our episodes are hosted by PodBean and also can be accessed on the University of Arkansas Extension website at

uaex.uada.edu/southernfruitcast. Here you can see all of our episodes and provide us feedback to help shape future episodes of this podcast.

[Out – McWhirt] We'd again like to thank the Southern Region Small Fruit Consortium for funding this podcast. The consortium provides a large library of production and integrated pest management resources at smallfruits.org. We'll be back again soon with more updates on the Southeast small fruit industry and interviews with specialist researchers and farmers from across the region.