

Transcript: Plant Breeding Stories Podcast
S3E7 - Lane Selman, Culinary Breeding Network



[Theme music plays]

Hannah Senior: Welcome to this episode of the Plant Breeding Stories podcast, where I talk to leading lights in plant breeding, asking what they do, what makes them tick, and what fascinates them about the world of plants. I'm your host, Hannah Senior of PBS International, world leaders in pollination control. We design and produce specialist, pollination bags and tents used by plant breeders and seed producers all around the world. And through this, I've been privileged to get a unique perspective on how plant breeding globally affects our diets, farming systems, and the environment. I'm excited to share a little of this with you as we meet some of the amazing people who make plant breeding their life's work.

Hannah Senior: Today, I'm talking to Lane Selman, founder of The Culinary Breeding Network. This extraordinary organization takes a radically different approach to variety selection. Bringing together plant breeders with chefs, farmers, seed producers, and the public in what can only be described as a celebration of variation and food system community building. Lane talks about evaluating breeding lines with the aid of such unconventional tools as open-ended conversation, cookery, art, anthropology, and even the odd bottle of Prosecco. And that brings insights that breeders might not even have thought to ask about. Transcripts of this episode and all our podcasts are available at www.pbsinternational.com/podcast. I hope you enjoy it.

[Theme music plays]

Hannah Senior: Lane, welcome to the podcast. Shall we start at the beginning? Tell me a bit about yourself and how you grew up.

Lane Selman: Sure. Thanks. Thank you for having me. I'm Lane, I am currently in Portland, Oregon, but I'm originally from Florida. I grew up on the space coast where people know the space shuttle and *I Dream of Jeannie* and these types of things. So I

grew up on a citrus farm. My family was originally from Sicily, where they were farmers and shepherds, and they had moved in the early 1900s to Florida and started farming there. So I grew up around farming my entire life and we had two citrus packing houses in my family. They were roadside stands on the way to NASA so a lot of tourists stopped by to get their orange juice. So kind of farming and food has always been a center in my life. I grew up around all of my Sicilian relatives and we cooked and ate a lot.

Hannah Senior: So which came first, the interest in plants or the interest in food? Because both come together in the story we're going to talk around.

Lane Selman: Yeah. When you grow up around something and it's just there, it's like fish not noticing the water. It wasn't like I noticed that other people weren't farming and eating as much as we were. And I had no intention of staying involved in this. I had high... I'm one of those people that was like, "I'm getting out of here. I'm going to study art." I actually wanted to study photography and I went away to school and then pretty much right away, I took an environmental science class and we started talking about soils and then we started talking about pesticide runoff and I started getting really interested in, I guess, what you would term back then "alternative" agriculture where it wasn't depending on chemicals, because that was my focus. Concern over the amount of chemicals that was being used. And we end up consuming it - on our food, in our waters. So that's when I said, "Oh, wow. I think I want to study agriculture!" [she laughs] Which was really funny because it never crossed my mind previously, even though I grew up my whole life around that.

Hannah Senior: Is that how you ended up focusing on agronomy?

Lane Selman: Yes. So then I was very altruistic when I was young and I thought, "Well, I want to study agriculture." So you could go horticulture or agronomy. And I said, "Well, it's these commodity staple crops that are what feed the world. That's what we're growing so much of and they use the heaviest chemicals in those." So I said, "That's it,

I'm going to work with those crops. I want to work with the row crops." And then I stepped further where then when I... So I studied agronomy as an undergraduate. And then in graduate school, I went to school for entomology because I felt that the chemicals that they used to control insect pests were the worst. And then I chose cotton because they could use the worst possible chemicals ever on that crop because we don't consume it. So I just went right into the eye of the hurricane!

[They both laugh]

Hannah Senior: Okay. So that sets a good scene for how you came to be in this space, but then from being in Florida and into entomology and integrated pest management, you ended up in the plant breeding world on the other side of the country in Oregon. So how did that happen?

Lane Selman: In my graduate studies and working, I worked with large scale farmers in Florida in an integrated pest management project. And I was trying to get them to spray less often and to use softer chemicals. And they really just weren't very interested in that, nor were they very interested in hearing from a young woman about these ideas. So I felt like it was very difficult to work in Florida as a young woman. And I started looking at other places to live. And I found that in Oregon, organic wasn't so unusual. So I left Florida and took a short stint working in forestry and then got a job at Oregon state university, working with a group of farmers that grew lots of different things.

Hannah Senior: And those farmers and humble spud led you to your first sort of light bulb moment when dealing with plant breeders, if I remember rightly. I know you described to me before that you were looking for a disease resistant potato that worked well in an organic system. And this brought you into contact with the university's plant breeders... Take it from there. What happened next?

Lane Selman: We had a meeting with them and they're like, "Oh, we've got so many different lines that you could grow. And we've got a lot that have absolute resistance to

late blight." And we thought, "Well, this is fantastic. We should have had a meeting with them like a year ago. This is awesome." So all the farmers got very excited and we're asking them all these questions. And then of course, one of them said, "How does this one taste?" And the breeder just replied very quickly. "Oh, they all taste terrible!" And that's when I started realizing plant breeders, aren't necessarily all thinking about what it is that each farmer needs, because for those breeders, they were thinking about the french fry market. They have very specific traits that they need for that. But good flavor is not one of those because it's going to be fried and it's going to have salt. So it doesn't really have to taste like very much.

Hannah Senior: So you had this realization and I'm guessing it just sort of buried down in your brain somewhere to marinate for a while, until you took on your next project, where once again, you were involved with variety trialing and tasting. Tell me about that.

Lane Selman: The next project that I started working on was called NOVIC, the Northern Organic Vegetable Improvement Collaborative. What we do in that project, it's led by Oregon State University and also involves the Organic Seed Alliance in Washington, University of Wisconsin at Madison, and Cornell university. And now also Colorado State. So all the Northern tier of the United States. There are breeders at each of those institutions and at least some of their work is focused on breeding for organics. We grow out all across the country their breeding lines of six vegetables that we focus on. Five of which are chosen, and we have to work on those. And the sixth is the farmer's choice, which is determined at each of these different locations, these different regions. We take these breeding lines that are not yet commercially available and we grow them out on farms alongside maybe new varieties that farmers haven't seen yet, how they perform on organic ground and varieties that we know really do perform well.

Hannah Senior: Yeah. And I guess by growing varieties at a range of different locations, it gives you a good indicator of how the genetics would interact with different environments too.

Lane Selman: Yes.

Hannah Senior: Yeah. Interesting. So now I'm going to jump at this point because your story crosses over with one of our other guests from season one, Laurie McKenzie from the Organic Seed Alliance. NOVIC was trialing and growing a red roasting pepper, which was being bred by Frank Morton to create an open pollinated variety of a roasting pepper that had traits similar to a hybrid that was no longer available called La Pari. And it landed on your shoulders to evaluate these peppers. Tell me about what happened then.

Lane Selman: I was the person in Oregon that was going out and taking a look at them on the farm. I was very impressed with how they performed a lot like what we think of as a hybrid, as being very uniform, being very vigorous. They were really kicking ass out there! I was quite impressed. But I knew because I talk to farmers all the time that flavor matters! What do these things taste like? And when I brought it up to our larger group at all the different universities, and I said, "How should we evaluate these?" They, kind of suggested just doing it like we were doing everything else. So if I go out and I am going to rate the trial for vigor or for lodging or for disease resistance, I'm going to give either a one to five or one to nine scale, we're going to walk the trial and we're just going to assign it something.

Lane Selman: And they do this with corn and it works really well where they do a bite test and they walk around and they bite the corn and then they decide, give it their rating. Well, I personally just didn't feel very comfortable with that because, well, for one I'm one person, I don't know if I'm really that great of a taster. [she laughs] People think I am because I started The Culinary Breeding Network, but that actually means I was just getting other people to do this rather than myself.

Hannah Senior: And you said you didn't much like peppers?

Lane Selman: Well, I don't. Yes. And I don't like raw peppers. So I was like, "I'm not going to just take a bite of these and I don't eat them raw." Which thank you for reminding me of that because they're roasting peppers. So there's a lot of different ways you can use them.

Lane Selman: But roasting is suggested in the name. [they both laugh] So you can eat them raw, you can eat them sauteed, you can roast them. So basically, what happened was I organized a tasting where I invited a lot of... I also worked at the farmer's market for a big farm. That was one of the farms that were doing this variety trial. And I knew a lot of chefs. So I invited the chefs on a Monday when they had the day off at noon, to get together and taste peppers. And they said, of course, because you know, chefs are always going to say yes to this. People are like, "How do you get them to do this?" I'm like, "I don't know. You ask chefs to come taste stuff. And they say yes." So we all got together and I had them rate them based on... I do the thing that the university researcher would do.

Lane Selman: I give them the one to nine scale. I ask them to rate them on appearance and then taste them in all these three different ways. And it was exhausting. It was far too much to ask them to do. I am not an actual sensory scientist. So I didn't know how to do this. What happened though, was pretty incredible because you know what often happens, I feel like, is we do things and we're asking a question, but not necessarily is it the right question. So they filled out this really long ballot. I got all the data points to put into the statistical software to crank out the answer. But I realize the answer really is in the conversation afterward. So when we did our ballot, we didn't talk, we couldn't influence one another.

Lane Selman: We put the ballots away, we opened up some Prosecco and then we just talked. And none of was planned. It was like we were just sticking around. And then what people told me, the chefs, it was mostly chefs, but there were some farmers there

and there's about 30 of us. They said, "Well, these particular of the nine," they're like, "Well, there's like these five, that all taste really good. We'd use any of them." And for that matter, they're kind of were like, "We could work with all nine of them really." But they're like, "What we really like is..." and they started pointing out the traits that they really wanted. And so always to me now, it sounds very obvious to say this, but at that point it was not, they pointed to rounded shoulders rather than the sunken shoulders that we envision when we think about a bell pepper, really straight walls. So this is what the chefs told me that would really be the thing that pushed them over the edge to this is the one we would choose.

Hannah Senior: And that's because it cooks more evenly. Is that why they have that preference?

Lane Selman: Okay. Yes. Cooking evenly as well as kitchen prep time. So as we can all imagine in our heads right now, when you're in the kitchen and you're cutting the top of a pepper off and you have the concave, the sunken top, it's a pain in the butt! Every time, it's like, "Okay, should I just cut the stem part out? And then that, or am I going to just cut it straight through and then make more even pieces. But then I have these little curve pieces I gotta deal with." So they think about that. They're like, "We're thinking about efficiency in the kitchen, waste, and even cooking." And so that was really the holy moly moment for me, where I thought "We really need to get these chefs involved in the plant breeding conversation." Chefs can go to the farmer's market and have a really great relationship with the farmer that they're buying produce from.

Lane Selman: They can go out to their farms and they can talk to them about it and see what they've got and all this. But it's like, there's this rabbit hole [she laughs] that I often think of it as that you can go down that's the seed. And a lot of times the farmers don't know this world either. And then the CBN, it's like just building more and more and more community and bringing otherwise kind of disjointed individuals in the food system together to learn from one another. So then that breeders can understand what the end

users want. And the end users start to understand more about this very complex world of our food system.

Hannah Senior: And from that event, The Culinary Breeding Network was born. It is that right?

Lane Selman: Okay. So that tasting then the following year, I said, "Okay, we have to repeat it because we want to repeat it. Because we do want data from this." And then I thought this would be a really fantastic time to actually have them make selections in a breeding project. So Jim Meyers, who's the breeder at Oregon State University, was working on a mild habanero that performed well in our short climate here in Oregon. So he had been doing selections for agronomic traits and he just didn't know what to do with the phenotype. He had small ones, big ones, yellow ones, orange ones, red ones. Shape, sizes, colors, and flavors.

Lane Selman: And so we brought several lines the next year to the chefs and they performed a selection for him, which then resulted in which line would move to the next phase in his breeding program. So at that event, which was 10 years ago this October was when I decided to call this something. I called it... I was like, "This is this initiative. This is The Culinary Breeding Network. And this is convening spaces, events, conversations for different individuals in the food system to talk about plant breeding."

[Theme music plays]

Hannah Senior: You're listening to Plant Breeding Stories, brought to you by PBS International, world leaders in pollination control. We're exploring the personal stories behind people who've dedicated their careers to plant breeding. Helping us to more productive plants, greater food security, and more sustainable agriculture. Now back to the podcast.

[Theme music fades out]

Hannah Senior: So we've been talking about the origins of The Culinary Breeding Network, but I want to shift the focus to the Variety Showcase now, which is one of the events that The Culinary Breeding Network puts on. Tell me more about that and how did it come about?

Lane Selman: People started hearing about it, the buzz of The Culinary Breeding Network before it was really "The Culinary Breeding Network". I had to dream something up. So what I dreamt up was an event that I didn't know... I mean, at the time I was like, "Whatever I'm doing this once." I didn't know it would lead to doing it so many times. And so I called it the Variety Showcase and the first event was 12 or 14 tables of which there was a plant breeder at each table and you would go to the table, it would focus on a certain species. So let's say cilantro, there would be multiple varieties, six to eight varieties of cilantro that you would be able to taste side by side. And there was one for beets and there was one for peppers and there's one for all of these different things.

Lane Selman: And so we organized these variety trials to happen. So we would have them to be all grown in one place, right? All the same environment. So then you're only experiencing the difference in the genetics side by side, you taste them. It's a very unique opportunity. Most people, especially with the cilantro would come to me and said, "Oh my God, I had no idea. There was more than one cilantro."

[They both laugh]

Hannah Senior: Yeah, who knew?

Lane Selman: Right. And then, the reason I chose the cilantro was there was a lot of chefs that started asking about cilantro root and they weren't interested in the top. They were just interested in the root. And I started wondering what the difference in these roots were.

Hannah Senior: What do you use cilantro root for?

Lane Selman: So in Thai cooking, they use it a lot in curries. They use them a lot in Mexican cooking and they're quite tasty.

Hannah Senior: Aha!

Lane Selman: So is the rest of the cilantro too. But anyway, they use it in curries. So you could go to the table and you would be able to taste side by side, different varieties of one species. And then the plant breeder, or the seed grower of the one that we wanted people to really know about, because the idea is that we're exposing them to varieties that have been bred specifically for organic production and flavor has been considered in the breeding process. So we're going to have the opportunity to taste some side by side. The breeder is there to talk about their work. And then they're matched up with a chef that then takes that variety, or that breeding line that is from that plant breeder and then makes a really fantastic dish out of it. So you get, there's a couple of different opportunities there to taste.

Hannah Senior: So the breeder is bringing, let's say five different types of cilantro to the showcase, but then one of those is one that's had particular focus that they then work with the chef to develop a tasting experience with. Is that correct?

Lane Selman: Well, they're not necessarily growing all of those. So what is happening is I would get the seed or the breeder would produce just theirs. But then I would make sure that there were all the other comparable varieties that are out there. So let's say Irwin Goldman at University of Wisconsin has got a really fantastic beet. He's going to bring the beet or else he'll give me the seed to grow the beet alongside many other varieties. So then you're getting to try the one thing that's from the breeder next to all those other things that are commercially already out there.

Hannah Senior: Oh, I see. Okay.

Lane Selman: Yes. So that's one design and then there's also a design of a table in which, in an active breeding project, like the current project that Phil Simon and Organic Seed Alliance are working on, where they don't yet have commercially available varieties. They're doing what I talked about with the mild habaneros, where they have lots of advanced breeding lines. These are the breeding lines that they know perform well in the field. They're the ones that are the most promising, but now they would like some input from consumers; "which one?"

Lane Selman: So their table would be maybe six different breeding lines and people get the opportunity to taste those and look at them and tell the breeder right there. And then talk to Lori and Phil who would be at the table, both probably, in that case and tell them what they like. Maybe lots of people don't like the looks of yellow carrots, maybe the purple ones taste too astringent. Whatever it is, they get a lot of feedback in this one evening. The carrot breeder has said, "I get more feedback in one evening at a variety showcase than I do the whole rest of the entire year."

Hannah Senior: And this is just the public?

Lane Selman: Yes, yes. So it's ticketed, open to the public. The very first one was free and I begged people to come. [she laughs] Now the last one was all ticketed and 700 people came to it. It sold out about a month ahead of time. So it's a big thing now. So there's been five in Portland, Oregon. There's been two on Oahu and there's been two in New York City. And it's cool because when we go to other areas, then we can focus... Because we go to Hawaii, there's completely different crops that we're working with and they have completely different needs.

Hannah Senior: Is it fair to say that the customers of the variety showcase are the breeders who are looking to get feedback or is there a broader set of people who benefit from the event?

Lane Selman: Yes, that's a good question. Yes. So I think that there's something for everyone. I think the breeders definitely are getting a lot of great feedback. They get that feedback from the actual public and a lot of individuals in the public and they get to have direct communication in explaining what they're doing. So the individuals that are there get to learn a lot about plant breeding. To me, and I make a little booklet that kind of talks about this, every single table gets a couple pages in the booklet, has a story and they're all different from one another. I mean, some people aren't really even doing novel breeding, they are maintaining and keeping going varieties that are important for our heritage. They're doing it for cultural reasons. They're doing it for seed sovereignty. That's the story in lots of the tables.

Lane Selman: It's like "we are producing open pollinated varieties because we believe in seed freedom and we see it being compromised". And so it's like, I'm trying to also talk about the values of these breeders because they're all each individual people and they all have very different motivations and it comes through in their work. And that's what I want people to experience. And I always bill it in this way that it's fun, it's beautiful, it's tasty, all the best chefs are going to be there. But we really are... The reason that they're coming into that room and the reason that I'm organizing it is because of those greater concerns that we have. Climate chaos, seed sovereignty. It is those heavy subjects that I'm trying to present in an enjoyable way.

Hannah Senior: And I guess a lot of networking happens at the event too.

Lane Selman: It is a serious connection event, also. A networking and connection event because so many people... I mean the general public comes to it now, but it is a place where produce distributors, grain wholesalers, bakers, chefs, all the farmers. I mean, it's probably 50% farmers. It's probably 75% people that are within the food and farming industry, which will make changes based on what they experience in that room.

They will find different varieties. They will create a relationship with someone that they did not have previously.

Hannah Senior: But they're not necessarily all organic. They could be from any production system, is that right?

Lane Selman: At each of the tables, all of the plant breeders, whatever they are showcasing and showing off, their variety or breeding line of focus must be bred for organic systems and considering flavor. Those are the two standards that they have to meet. But yes, there are a lot of individuals that come that yeah, are not focused on organic, but they care a lot about flavor and they know they can come into the room and find varieties that taste great and probably varieties that they haven't heard of before.

Hannah Senior: So I want to jump back to something that you said at the beginning, which is that you initially wanted to be in the art world. And my sense is that through The Culinary Breeding Network, you've been able to combine this love of art with the agricultural world. You have beautiful graphics and design for the events and you make a point of integrating art when you're running these. So why do you do that? Can you tell me more?

Lane Selman: Everyone is different and what's going to grab their attention and keep their attention is going to be something different, right? And I guess I just personally am very interested in art. I love art. And I think that beauty grabs people. A lot of times people, folks at universities can present things in a pretty boring manner where there's a lot of words like "Here's the flyer for this thing that we're going to do." There's a lot of words, people don't like words. I wish that they did, but they don't. So when I design the flyers, I partner with local artists; that could be an illustrator, that could be a painter, that could be a photographer, to make something really beautiful that's going to grab someone's attention. And then within these events, I try to organize something that's

going to be a different way to experience... Maybe try to get the same information across, but in a different way or just make them interested.

Lane Selman: So this last time at the variety showcase in Portland, Oregon, a lot of plant breeders will talk about how vegetables have changed over time and use old paintings for that, right? From that, it's very interesting, you can see there's a center of origin for where whatever species is from. And then we can find, "Okay, it moved from here." This is how we know a lot of times where it's moved and what it looked like then. This one focused on a lot of Renaissance paintings of like, this is what they look like in markets in Italy or in the Netherlands or whatever. It's like, this is this year, look at what it looked like then. It looks different now. And this is the story of plant breeding, right? In a beautiful way.

Lane Selman: It's like through selection and people choosing which ones they like and saving the seed, it changes. The story of carrots and the pathetic little root it used to be and how it's white in some places, and here it's orange. It's incredible. So it's culture, anthropology, travel, art, all of these kind of more humanities related things, rather than just the science, science, science draws people in. Just like I diversify the stories at the tables. This person is a university plant breeder and they want to create hybrids that perform really, really well for a farmer and yield as much as possible, but also taste good. Cool, whatever. Another farmer that's like, "I'm actually originally from Palestine and I am making sure that the varieties and the foods of my world survive and are celebrated in this part of the world." I want to diversify the individuals, their motivations, their values, and also the way that is presented.

Hannah Senior: I love it. And actually, that's one of the things in doing this podcast, that I set out to achieve was a different celebration of diversity, but to recognize the motivations and the ways in which people go about doing their craft, because it is, plant breeding is really important for lots of different reasons and highlighting that I think does

stop it from feeling like it's an entirely sterile pursuit, it's not. I think it's really important to communicate that.

Lane Selman: Exactly!

Hannah Senior: And it seems like one of the messages from all of this is the importance of embracing the qualitative alongside the quantitative, whether it's plant breeding or trying to encourage people to try different things. It's not just about the hardheaded science, it's about the passion and the enthusiasm and the color and the flavor that carries people with you. Is that a fair characterization?

Lane Selman: Yes. I mean, when I think about, let's say, okay, *Stocky Red Roaster* was that one pepper. That was the one that kind of won the tasting. Now we didn't crunch data on it. I don't have statistics around that, because I don't think that there was significant difference because of just the way that it was set up. I'm not a very good scientist, but I'm very good at talking to people. But just from the buzz, just from talking to the chefs afterward, getting their input, sharing it with others, putting it on social media, all of this, you know, Frank always says his seed sales for that variety went up 500%. That's the impact. I mean, it's good to have the data behind it. It's great, but we didn't need it. This was just as valuable.

Hannah Senior: And breeding programs are pretty much always challenged by finding funding and keeping funding year after year. How does The Culinary Breeding Network get its funding?

Lane Selman: It's not funded. It's very challenging to get grant funding. I feel like more and more because there are... It's more and more competitive. I'm kind of a square peg trying to be forced into a round hole where I'm writing a grant proposal for organic farming. Sometimes they just don't get it. I don't think they understand the impact. The breeders understand the impact. They get it completely, but the funders don't really understand it. And it's hard because it's something completely different. So it's

challenging. So it has been, when I do these events like the variety showcase, it's very costly to put on. It takes a lot of time. And so sometimes a little bit of funding will be in grants, but I'm having to get sponsorships from companies and I'm having to charge tickets also.

Lane Selman: Plant breeders that are listening right now. I mean, this is what happens with a lot of the work that I do actually as large breeding programs, projects that get funded, in their grant proposals, they will write in the outreach extension part of it would be culinary breeding network, myself would be in there. If you want to be part of The Culinary Breeding Network to participate in this outreach and organize events, or a lot of times just kind of create the overall branding on a national or international kind of level, I am very happy to work with you. I definitely need more opportunities like that!

Hannah Senior: Well, we will make sure that all of your contact details are available in the show notes. I'm going to have to wrap things up, but before I do, what are you most proud of so far in your career?

Lane Selman: I guess I am most proud of getting so many people involved and attending these events. I am not an event planner, I am an agronomist. And so I do feel like that's a really big accomplishment to figure out how to put on something so big and get people in the public interested. I started with \$2,500 from Organically Grown Company, which is an organic distributor here in Oregon. And we did it. Everything had to be donated, basically.

Lane Selman: I actually used the money to pay the plant breeders and seed companies to come and to participate. And then they were like, "You don't actually have to pay us! [she laughs] This is actually really good for our work and our businesses." Everything was so scrappy and grassroots that I think I am the most proud of like, "Wow, I had \$2,500 and a vision. And it's turned into this thing where the last time it's in this huge, over 10,000 square foot, enormous, beautiful renovated warehouse space." I walked out

to see if my son was there and it was waiting a line... like the people waiting in line for a concert. I could not believe it. And I was like, "This is nuts!"

Hannah Senior: And I don't think there are many people who can blend their interests as successfully as you have done. I think that's quite remarkable as well.

Lane Selman: Oh, I'm always trying to do it. I'm like, you know I'm very interested in Italy and I'm like, "That's it got to work with radicchio, got to go over to Italy. Got to..."

[they both laugh a lot]

Hannah Senior: [laughing] Good work!

Hannah Senior: Lane Selman of The Culinary Breeding Network. Thank you very much for sharing your story with us, your energy and enthusiasm and innovation. It's all incredibly inspiring. So thank you very much.

[Theme music plays]

Hannah Senior: You've been listening to Plant Breeding Stories by PBS International and I'm your host Hannah Senior. Plant breeding is a pretty specialist podcast topic, which can make it difficult for people who share our interest in this kind of thing to find it. So if you've enjoyed the podcast, recommend it to your friends and colleagues, and please help others in the plant science community to find it by rating this episode and subscribing to the series. I'd love to hear from you if you want to suggest people you'd like me to interview. You can contact me on Twitter @PBSint or on Instagram at PBS_Int. Until next time stay well.

[Theme music fades]