

Transcript: Plant Breeding Stories Podcast

S4 E4 Emily Negrin



[Theme tune 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: Series Four will be the last in this podcast, and it has been the most incredible experience to dig into so many different aspects of the plant breeding world, and *literally* the world. If you're listening to this, you are part of a community that spans the globe from Albania to Zambia, Adelaide, Australia, and Ames, Iowa to Zurich in Switzerland. Emily Negrin is not a plant breeder, but a Senior Director of Corporate Affairs for the AI meets gene editing company Inari, her world revolves around the communication of plant science and biotechnology. In this episode, we explore how many misunderstandings there are about agriculture and genetics and how emotional the topic of food can be. Emily talks about how important it is to learn from past lessons and shares some tricks of the trade that make the difference between communication and good communication. Transcripts of this and all our podcasts can be found on our website at pbsinternational.com/podcast. I hope you enjoy it.

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Hannah Senior: Emily, welcome to the podcast. Can you please introduce yourself and tell me a bit about what you do and what Inari does?

Emily Negrin: So my name is Emily Negrin, I am Senior Director of Corporate Affairs at Inari. My focus is on helping the company communicate, especially to external audiences. So Inari is a seed design company. We are working to build seeds in a way that are more sustainable, not only for the planet, but also for the people who grow them. And we're not on this journey because it's easy, we really do think that this is critical because growers across the globe are facing climate change. It's not a matter of if and when, it's, how and what is the impact going to be? Starting with corn and soy, we are looking at how can we make changes to the natural DNA of a plant to help it grow better and use less resources. And we're doing that through our seed design platform, which has two key components to the technology.

Emily Negrin: We have our predictive design, which is really using cutting edge AI technology. And then the other side of that is taking the blueprints that's really created from this predictive design and applying that to our multiplex gene editing toolbox. So that's when we go into the plants and actually make the changes. So that is our main focus using these advanced tools to make improvements within the natural DNA in the plant so that ultimately we can build a more sustainable food system.

Hannah Senior: So your role as Senior Director of Corporate Affairs is not actually doing the plant breeding. So I'm curious, what was your background? Did you have a background in plant breeding or plants or agriculture? Tell me about that.

Emily Negrin: No, my really only background in the world of agriculture comes from the fact that both of my parents grew up on farms, though I have very much been a city girl my whole life. My dad actually has worked in agriculture his whole career, he has his Masters in Weed Science and being the wonderful daughter that I was, I thought nothing was more boring than agriculture and I used to tease him, that I would never do anything in agriculture because that's boring stuff. I went to the University of Minnesota

and it should have been a sign that one of my favorite classes was titled “Science! Hot off the press!”. And we spent a lot of time looking at especially agriculture issues because that was a big thing because it was about the time that BT was hitting everybody's radar in the GM world.

Emily Negrin: And it was taught by somebody from the ag school, and it was basically me from the school of journalism and a bunch of students from the ag school, but it was a lot of fun. It took probably a good decade before my career fully shifted into public relations in the realm of agriculture. But once I started, I was completely hooked. With my family roots in agriculture, I was always very aware of things that were going on in the world because of my dad's profession. When I would talk to my "city folks" no one talked about agriculture. And then there was this shift that started happening and it became something that everybody to talk about and everybody had opinions on. And I realized there was a lot of bad information out there. And I felt very passionate about using my area of expertise of communications to get involved in agriculture and help provide clarity because how our food grows, literally affects everybody in the world.

Emily Negrin: And it's too important to not communicate clearly and help people understand because it's not a black and white topic area. There's a lot of complexities, and when either side tries to oversimplify, you're doing a little bit of a injustice. To help be a voice of clarity and help people understand all the incredible work that is going on and the importance of that work and how it has larger impacts was really important to me.

Hannah Senior: I'm going to assume that for many of the listeners, public relations and corporate affairs are things that they don't necessarily really know a huge amount about. So can you tell me a bit about the scope of the work that you do so that we can connect the dots in how that relates to agriculture and plant sciences?

Emily Negrin: So we think about how we work with external audiences to either share information about Inari or talk about the industry in general. So we're the first point of

contact for media. We also manage our own what we call owned channels, so things like social media and websites. Anytime we create printed materials, that's going through my team and making sure that we have clarity in the messaging and that it's aligned with what our business is about. But then it goes a step further, so we work with cross-functional teams to think about what we call license to operate. It's cutting edge technology and that makes some people nervous.

Emily Negrin: So how do we gain acceptance because we know what we're doing? How do we better communicate to help them understand what and why we're doing so that we can help ensure the full opportunity of the technology can be realized and that we have acceptance as it moves forward within society. If I had to boil it down to a nutshell, it's how do we tell a story of Inari and also create a better understanding for the work that we're doing to a wide range of stakeholders.

Hannah Senior: So Inari is using technologies like artificial intelligence to then create genetic sequences that can be implemented through gene editing. So those are two pretty new advanced technologies and both controversial technologies at that. And you are using them together. So I can see that you'll need to be really careful in communicating that science to people who don't necessarily have an in depth background in these technologies. Is that right?

Emily Negrin: Yeah. And I think even that first component with our predictive design, which is where we're using more AI or machine learning. That is more of connecting our end to end system and there are things that machines are really, really good at. And then there are things that machines are not so good at. And there are things that humans are really, really good at and there are things that humans aren't so good at. And one of the things we as humans aren't good at is being able to process mass amounts of data. And when you think about plants and their DNA and all the different sequences and connection points that's just too much data for our brains to process, but

a computer can go through that rather quickly. So we really think about predictive design as improving our decision making capabilities as humans.

Emily Negrin: So we still very much have a human element. We're not just letting the machines make all the decisions for us, but they're narrowing things down and giving us better insights into the data so that we can use our human knowledge and apply it and make the best decision. Once we know how and what, and where we want to edit, we take those directions and then it goes to what we call our multiplex gene editing toolbox. So that's where we figure out how exactly we're going to make these changes in the plants and implementing that and then continuing to move that down the product development process to ensure that the edits that we made created the changes that we were looking for so that we can have the impact that we want to have.

Hannah Senior: So how do you know if you're doing a good job? If you're plant breeding and you are saying, "Right, I want a disease resistant plant." You can tell if, when it's coming into contact with that disease, is it doing well or is it not? How do you know that you're doing a good job of communicating what the company is doing or what the science is about?

Emily Negrin: There's different ways you can look at it. So we are just about five years old now. So part of our work right now is just gaining brand recognition. You could obviously spend some money and do some really good studies to determine what your brand recognition was before and after and there's a lot of companies that... And it's a wise investment to look at that. But some of it is also just feedback you're getting. We just got back from the American Seed Trade Association's winter conference in Chicago. And one of the great points that we got was people saying, "We're starting to see you guys' name a lot of places. We're hearing a lot about Inari what exactly are you up to?" So that's one proof point to us that what we're doing is working.

Emily Negrin: Another thing is having media proactively come to us and saying, "We want to talk to your experts because we know that you guys are cutting edge and you

guys are working on some interesting things and you are really leaders in what you're doing." So that's another way we gauge it. There's a lot that can be done in backend on social media and websites, just to look at your reach and engagement and conversion rates. So those are other more quantitative impacts that we look at as well. It really depends on what are your goals and what are you're trying to achieve, and then figuring out how you want to measure that. So we also look at media coverage and we apply for different awards. So getting, sometimes, that third party recognition as another way to validate.

Emily Negrin: We also partner with industry organizations, I talked about ASTA, American Seed Trade Association. So that's a group that we work closely with to think about, especially gene editing and how that's being perceived by the public. Because that's an issue, it's very important to Inari, but that's not something that we can address by ourselves. There's a little bit of "we need to work together to ensure that society understands the opportunities of this technology" because there's a lot of people in the industry who are using gene editing technologies, but looking at very different things. Maybe looking more at the nutrient components of plants and there's a great example, right now there's a tomato that is on the market in Japan. And they were able to make it more nutritious.

Emily Negrin: That's nothing that Inari is really looking at, but it's great work. And we don't want those guys being prohibited from doing that work and other people who are looking at things like the nutrient components in plants. We all benefit by having social acceptance of that technology, and it creates that path for all of us to be successful in our own right. So there's times that camaraderie across the industry is important and that we understand the impacts of that.

Hannah Senior: For a lot of our audience who are in the science world, they will have been encouraged as they go through their education, particularly at graduate, postgraduate, PhD, et cetera levels. There's this encouragement to focus on communicating what you're doing and particularly science communication is a thing in

its own right. So tell us a little bit about your perspective on, how is science communication different from general communication?

Emily Negrin: There's a lot of similarities, but there are some key differences. The accuracy of what you're communicating, the clarity of your message is important. And I love the scientists, like I say, I'm a groupie of our science department and they do quite a bit of presentations to the scientific community. I don't get as involved in those presentations because in those situations they are presenting as experts on a specific topic to another group of people that have a high degree of technical knowledge. I like to say, they're talking inside baseball to one another. That's where the accuracy of their information that they're sharing is of the utmost importance. It's very critical that they use very specific words to ensure that they're being very clear about what they're talking about. And when they're writing for scientific papers, again, very important.

Emily Negrin: When we think about public audiences, it is important and critical to be accurate, but at the same time, if we talk inside baseball, we're going to lose people. When I first referenced earlier, I saw this turning point at some point where people started caring a lot more about agriculture and all the misinformation. And I remember having a conversation with my dad, because I wasn't really working in the industry yet, but just watching everything going on around and I turned to my dad I'm like, "How is this not so frustrating to you? How are you not more worked up that there's all these things being said that aren't as necessarily true and people just believe it?"

Hannah Senior: And this was because your dad specifically worked on Roundup, didn't he? Which of course has been quite controversial. Is that right?

Emily Negrin: Yeah. So he worked for Monsanto and had done a lot of work with the trade technology and he laughed and he said, "Emily, how many of your friends excelled in biology in high school?" And I laughed because not many of them did. And he's like, "Most people got through science the bare minimum and they forgot it as soon as they could." And now we're talking about DNA and how we can alter DNA and put different

DNA in. This is complex to people who excelled in science, and now we're asking people who barely passed high school science to just accept it. And he's like, "I get why it's hard to understand." The advice a lot of times I give to our more technical people is "explain it like you were going into a classroom of fifth graders". And not because I think that the average person isn't smarter than a fifth grader. But that's probably, if we're all being really honest with ourselves who have not spent their professional career in the sciences, that's probably where our science memory gets us to - is about that fifth grade level.

Emily Negrin: And if we're being really honest with ourselves on a day-to-day basis, most of us have about the attention span of the fifth grader sitting in a classroom. When it's topics that aren't necessarily piquing our interest right away. So how do you help people quickly understand the most basic elements so that they can begin to ask smarter questions? Because I think that's a lot of times the key thing. We're never going to get everybody to completely understand everything. But when they get bad information, if they have enough good information to question it, to me that's a win.

[Theme tune 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.

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Hannah Senior: We've been talking about communicating science and new technologies to a really wide audience. So do you have a particular recipe for doing that? Any fail safe tips that you can share with us?

Emily Negrin: Finding analogies. So when I talk about our seed design platform and how we do predictive design and we talk about that creating a blueprint and I said, it doesn't actually create a blueprint. But everybody has an understanding, everybody's seen a blueprint, everybody knows, "Okay, I get what the purpose of a blueprint is. So that analogy helps me understand at a basic level what you're doing." So any time you can make analogies to things that you would consider just very common knowledge that helps people. And I know sometimes, and I giggle because sometimes especially our scientists are like, "But that's not perfectly accurate." I'm like, "Sometimes we have to let go of absolute perfection for basic understanding." I joke a lot of times I ask the question, "Is it wrong? Or does the scientist in you just want to add a lot more detail?" And sometimes like, "Well it's wrong." It's like, "Okay, then let's make it right." And sometimes it's like, "Yeah. I want more detail."

[They both laugh]

Emily Negrin: Another ingredient I would say for success is keeping it simple and allowing people to ask the next question. You're not going to make them understand everything right away and you risk overwhelming them. So thinking about what is the most important thing for them to understand and communicating that first and giving them time to observe that information and ask a follow up question or present them, "Okay, so now they understand this, how can I build on that?" And thinking about it as building blocks of information, instead of trying to get them going from ground zero to a skyscraper in two seconds. Because the second we start overwhelming people, they zone out.

Hannah Senior: One of the things that particularly when it comes to genetic engineering, gene editing, GMOs, people have a lot of... Even people who maybe don't even really understand what it's about, they've kind of heard, there's a sense of "Oh, that's not good, is it?" They come with some baggage. So how do you anticipate that

baggage? Do you anticipate it? And how do you help to overcome barriers to getting into really meaningful conversation?

Emily Negrin: The industry as a whole, I think, made the assumption that nobody would really care because a lot of things have been going on in agriculture for decades that nobody paid attention to. And they didn't think that they would care anymore or less about this. And we were wrong and people who were adamantly against the technology got in there and they started the conversation. And they put the industry on the defensive and that's a really bad place to enter a conversation from. Letting go of that baggage that we tend to carry from our messaging experience with transgenic, but learning lessons and entering conversations with gene editing in a new light and not making comparisons because it's really apples to oranges. And what a lot of companies are trying to achieve through gene editing is different from what was being achieved in the transgenic traits.

Emily Negrin: There were a lot of high hopes in the days of transgenics that we would be able to solve big problems, but we have now the benefit of time that has given us a lot more knowledge. And what we have learned is there isn't a single trait you can edit or add, that's going to dramatically increase yield. There isn't a single trait you can edit or add that is going to help a plant use water more efficiently or use nitrogen more efficiently. These are very complex systems within a plant and it requires a deeper understanding, which we now have. It requires a very different toolbox, which we now have. So talking about gene editing in a whole new light and I have been very encouraged, even seeing some of the things that have come out of the EU commission that was looking at gene editing and they very much identified that this is an opportunity to help farmers meet sustainability goals. And it very much is because it allows us to address these very complex systems within a plant to make the types of changes that are needed to improve sustainability.

Hannah Senior: You mentioned that Inari is working on soy and corn and you've mentioned sustainability, could you expand for us on what kind of traits are the focus in order to improve the sustainability of those crops?

Emily Negrin:

In soybean right now, we have set a goal of trying to get to a 20% yield increase. And that's pretty incredible when you think that the average year over yield increase for soy has been less than 1%. The first product out of the gate, is it going to be 20%? Nope! But that is part of our North Star and it's something that we're working towards. On corn, we're aiming for a 10% yield increase. There's been a lot more done in breeding through corn to increase yield, but even there, the average yield increase year over year, I think is somewhere around, I think it ends up being 1.2%. So that's still an audacious goal, but on top of that, we're also looking at corn of "how do we reduce its need for water and how do we reduce its need for nitrogen?".

Emily Negrin: That's our starting point. We're actually starting to look at wheat as well. We're going to be starting some projects on wheat. I think the most important thing is the way that we've built our seed design platform is ultimately going to allow us to apply our learnings to any plant in any geography. So we'll keep building that knowledge base and this is just a starting point for us, but it's a very exciting starting point for us.

Hannah Senior: One of the things I could imagine happening is that even if you manage to get people over the line in terms of the technology or sustainability, you may still encounter pushback on the business model. Specifically, I know there's a pushback on companies protecting IP and seeds and genetics. Is that the case? And if so, how do you navigate that?

Emily Negrin: Yeah, and I think that is truly one of the most beautiful things about gene editing technology. So I'm sure many people have heard CRISPR talked about at this point in time. That is definitely a tool in our toolbox that we're using, but the great thing about it is it is a very accessible tool. Universities across the globe are using it. The tool

and application isn't such that only a few people can afford to do this. That's incredible for a number of reasons because the more people we have doing research and looking at opportunities, the more we uncover, the more knowledge we all gain. And I hope that there's lots of different discoveries that help move us forward, because addressing the challenges of the food system, isn't something that any one company is going to solve or any two companies is going to solve. We need a lot of really smart people thinking about this. So I like that this technology opens that door and gives access to more people to explore.

Hannah Senior: So it sounds like the key way of responding to that concern over IP ownership is yes, there is ownership of the IP, however, it's not leading to market dominance in the way it has historically, because I suppose historically the commercialization of seed biotechnology was heavily consolidated. Wasn't it?

Emily Negrin: The whole IP thing is an interesting topic in and of itself, but it's really hard to encourage companies to invest in research and development without some level of protection. I think there're some opportunities to improvements in the system, but I do think it's good that you're going to have a lot more people with ownership in this as we move forward. Because I agree that is one of the big pushbacks you're hearing right now. People have gained a better understanding for what's taken place with the traditional GM technology with transgenics and maybe have a level of comfort with the technology itself, but where they get a little uneasy is ownership and the idea of that being such a few companies. So I think opening the door and having more people involved is good not only for research and discovery, but also provides a level of peace of mind for consumers.

Hannah Senior: So what happens when you are communicating this and you come up against really baked in opinions or even misinformation. How do we go about thinking about that situation?

Emily Negrin: Those are challenging. I think about opinions on any topic as a bell curve. No matter what you're going to have people on extreme sides who have very strong beliefs and they are never going to change. Most of us listening to this probably fall on one end of that bell curve on gene editing technology saying, "We believe it's good and nothing anybody tells me is going to make me feel otherwise." Where I like to focus is the top of the bell curve. Because most of the people don't have that strong of opinions formed, historically called them the movable middle. And these are people who have heard a lot of things one way or another and they might be leaning, but they haven't completely made up their mind. So if you're going to focus your energy, that's where I focus. But when you do run up against those people who have stronger opinions, I think it's always important to lead conversations sometimes with questions and don't make assumptions of why they have that belief.

Emily Negrin: It's easy to assume like, oh, you've just read a bunch of junk on the internet and you have no idea what to talking about. You don't know. So ask what makes you think that? Why do you believe that? Have you considered this? I've had some really surprisingly good conversations with people who don't agree with me on topics. And even if you don't change that person's mind necessarily, if you have challenged them to think a little bit more critically, I think a lot of times you have to accept that as a win. But also think of it as an opportunity to gain insights into where the other side is coming from. Anybody who took debate in school learned that the best way to create your side of the story is to give the other side's argument.

Emily Negrin: So how is the other side arguing this? Because then you can build a much better response for those challenges. Even if you can't crack their beliefs, does it help you tell a better story the next time you talk to somebody? And does it help you understand things maybe in a new way to help you bring new information to the discussion so that you can move people closer to acceptance when they maybe are falling a little bit further down the other side of that bell curve than you'd like them to.

Hannah Senior: And one of the things that's interesting, isn't it about food conversations, specifically food production is how quickly they get polarized. You often find that topics, people do take very strong opinions and I suppose it's just really notable that that happens in food. So why do you think that is?

Emily Negrin: Food is very personal. If you've ever had the opportunity to travel internationally and see how food plays a role in culture, no matter where you go. And it's not only culture in terms of nationality, but within families. Food means something for a lot of people. It's how we talk about our heritage. So it feels like a very personal topic. And I think that's why you have these strong opinions - because it's emotional. And I think that's probably one of the biggest lessons that we learned when we started having these conversations around transgenics is science came and we're like, "Let us give you the facts. Let's have a very rational conversation because there's good data, there're facts and let's talk of about them and you should accept those facts because they are facts."

Emily Negrin: You're talking to people who having a very emotional response and it's like, "This is my food. I need this. This is a source of life. I understand that when food is bad, I can get sick. So now I'm scared and I don't know what's going on." So we were trying to have a very rational conversation with a group of people that were ultimately having a very emotional reaction. And anybody who's tried to calm a two year old down when they're having a temper tantrum knows rational conversation and emotional reactions don't mix well. So I think we've learned a lot of lessons and have been very thoughtful at coming at things from more of an emotional place and appealing to people's emotions to say and being understanding like, we understand that this is food. This is important. This is your nutrients. But it's because it's so important that we feel so strongly and that we're doing these things.

Emily Negrin: We understand that food is a source of life for every human being. I don't care if it's a scientist in the lab or a farmer in rural Nebraska. When you talk to people and why they do what they do, it really comes down to a belief in the importance of food

and feeding people. So if we can find those common points to start from and build from there, a lot of times we have much more productive conversations.

Hannah Senior: What things do you find hardest in your role? Most challenging and difficult to power your way through and how do you overcome those hurdles?

Emily Negrin: There's so much information that we want to share, how do you condense that and pick the most important things to talk about at a given point in time to ensure that you're sharing the right message? I always laugh. I make people practice before they have a media interview of answering the question, "who are you and what do you do?". And it seems the most basic question, but for so many of us, there's lots of components to what we do. We don't have, necessarily, a simple, straightforward job. So the more information you have about any topic, the harder it is to synthesize a response. We can't share a full textbook of information. How do we condense this and get to the information that we need? On a more personal level, I joke all the time having spent my career in communications, talking in writing is something that everybody does.

Emily Negrin: So there's a lot of people who believe that, well, I talk and I write emails every day, I too am an expert communicator. So it's always interesting. There are people who very much understand and appreciate what true professionals can bring to communication strategy. And I am very thankful that I have an amazing leadership team at Inari who very much respects the practice and what myself and my team can bring forward. But you always run into it's like, "Well, it's just words." So that makes me laugh a little bit. I've been doing this long enough that I don't let it bother me, but you always can tell when even if they don't say it directly, when you're up against somebody, that's just like, "Well, why do we need somebody in communications? I can talk!" And it's like, "Well, but communicating and communicating well and communicating efficiently and communicating strategically are often different things."

Hannah Senior: Before we wrap up, this conversation will hopefully be broadcast or shared podcast to an audience which is global. We know we have listeners all over the

world and I assume mostly it's people who are interested in plant science and seed production and plant breeding and so on. So are there particular messages that you would like to use this opportunity to communicate with that audience?

Emily Negrin: No matter where you are and what you're working on, if this is technology that you believe in, all of us do have a voice and there's lots of avenues that we can communicate. And even if it's just talking with friends and families at dinner, or if you are an avid social media participant, or if you are involved in your community, just being a positive voice for gene editing technology and being a trusted voice in your circle of influence probably has a greater impact than you realize. So if this is something that you too believe in, that you are concerned about creating a path forward for gene editing technology and want to make sure that this is a reality that we can have in the future, I would say share your voice and find ways to communicate your beliefs to others.

Hannah Senior: That feels like a good place to wrap things up. Thank you so much for your time today. It's been really interesting talking to you and learning more about what you do and what Inari does. Emily Negrin, thank you very much.

[Theme tune 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 @pbs_int. Until next time, stay well.

[Theme tune fades out]