

Transcript: Plant Breeding Stories Podcast

S1E4 - Jodi Souter of J4 Agri-Science



[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.

Hannah Senior:

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:

This week, I'm talking to Jodi Souter from Saskatchewan, Canada. Jodi talks about forging her own entrepreneurial path as an independent plant breeder about competitive athletics and how it helps her in her business and her Nuffield Scholarship study into the regulatory frameworks that underpin the plant breeding industry in Canada and the rest of the world. I hope you enjoy it.

[Theme music fades out]

Hannah Senior:

Welcome, Jodi Souter of J4 Agri-Science. Would you like to start by just tell me a little bit about yourself?

Jodi Souter:

Absolutely. So, as you said, my name is Jody Souter. I am a Canadian plant breeder. I grew up in small town Saskatchewan, Canada. And so it's a rural farming type community. And when I say small, to put it into context, I graduated in a class of five people. So it's quite small. My dad is a farmer. So when we were growing up, me and my three sisters, my dad and my uncle had actually just started a dairy farm before we were born. And they were grain farmers as well with their dad. And so we kind of saw the development through our early lives, the development of a company, an agricultural company. So I guess my path to plant breeding was unusual, I guess.

Jodi Souter:

I didn't really know what I wanted to do when I went into university, I'd been accepted into a couple of different programs and I actually ended up in arts and science for two years and then recognized, and an astute counselor, I guess, school counselor recognized that I was setting myself up for a plant science degree. So I actually

switched into agriculture. I really was science-based I knew I wanted to do something in the sciences, I was a little bit of a science nerd growing up, but the plant aspect and the agricultural aspect really drew my focus. And to be quite honest, I knew what a plant breeder was. I kind of knew what they did, but I'd never even given it a second thought until I took my first introductory plant breeding class, and it was just like that light bulb moment. I walked in and it was like one or two classes in, and I'm like, "This is what I'm supposed to for the rest of my life."

Jodi Souter:

And we had a fantastic professor in it. And it was just one of those life-changing, I guess, courses that finally made my path clear.

Hannah Senior:

I've never been to Saskatchewan. What's it like?

Jodi Souter:

What is this Saskatchewan like? Well we get made fun of a lot for being flat. We also get made fun of a lot for being the province that's easy to draw, but hard to spell. So Saskatchewan, if you know Canada, it's pretty much halfway between Vancouver and Toronto give or take a little bit, it's right in the middle. It's a large province, so it's actually a quite diverse province, but most people who visit only hit a very small portion or tour a very small portion and that portion is quite flat. The joke is that you can see your dog running away for five days, those kinds of jokes. But realistically, it's a very varied geography, I guess, because there's forest in the North and it is quite far to the South and where I'm from it's still farming and agricultural land.

Hannah Senior:

Climate wise, do you get very warm summers? Very, very cold winters and quite short summer season, is that how it works?

Jodi Souter:

Yeah, so very short summer, but I think we have one of the best summers in the world. I love it, but it is quite short. So we have late April early May is kind of where everything melts, all the snow melts, and then we'll expect our first snowfall mid-October early November. And so our summers yeah, we get up to 32, 34 degrees Celsius. We're usually about 25, 26, but we will get up to those high temperatures, but we'll also hit minus 30 minus 35 in the winter. It fluctuates very, very widely between the seasons, right, so.

Hannah Senior:

The climate and those extremes of temperature must affect the way that you carry out your plant breeding, right?

Jodi Souter:

Yes. We definitely have different strategies of breeding, I guess, than other places around the world that have the potential to plant year round or, just modifications with poly houses or shade clothes can plant year round. I mean, the environment helps agriculture. It helps us reduce diseases and insects, we definitely have enough diseases and insects that can still come in in our summer, but for the most part, compared to other places around the world that minus 30, 35 really does decrease our prevalence, I guess, of insects and disease. So that really helps the agricultural community, but it's not that easy to breed outdoors in minus 35. So you have to come up with other options, obviously.

Hannah Senior:

And in Canada there's some really stringent professional qualifications you need to acquire before you can market yourself or put yourself out there as a plant breeder. Tell me a bit about that.

Jodi Souter:

In Canada, to be a CSGA recognized plant breeder, you either need to get a PhD and then do a year of independent work, I guess. That gets evaluated by a group of your peers or... Which is the path I took. And, or you can do a master's and I believe it's five years of study before you get evaluated by a group of your peers. And so that was quite daunting.

Jodi Souter:

I did well in school, but I'm not really the personality that I should be a lifetime academic. Going into grad school, scared me a lot. And so when I got done my undergrad, I knew I wanted to be a plant breeder, but taking that commitment or making that commitment to go into grad school was really difficult. And sport helped me. I was still involved in sports through the university. So I was like, "Okay, I'll start my master's. We'll do the master's." And then eventually I did roll up my master's into a PhD. Got that requirement out of the way. Did my independent year, I guess, of plant breeding and then applied and I am now recognized in Canada as a plant breeder.

Hannah Senior:

CSGA, if I understand that correctly is Canadian Seed Growers Association?

Jodi Souter:

Yes.

Hannah Senior:

Do you need to be readily recognized by CSGA in order to be a plant breeder? Is it a prerequisite?

Jodi Souter:

So the crops that I would work on and most broad-acre crops in Canada are regulated by the CSGA. And so to register the crops, you have to be a recognized plant breeder, or also recognized plant breeder has to register those crops for production in Canada.

Hannah Senior:

So you got your PhD, you became a CSGA recognized plant breeder, and then you decided that you weren't going to stay in academia and you wanted to set up your own business. So tell me a bit about that, because that is a somewhat unusual set of decisions to make. Tell me about how you chose that path.

Jodi Souter:

Yeah, it's very unusual and even more unusual in Canada, I think, than other places in the world. A few life events happened right as soon as I finished my PhD, I ended up taking a couple months off and running harvest with my dad. My grandpa passed away and my uncle broke a hip right before harvest. So we lost two of our main managerial people in harvest. And obviously that's a tough time to go find somebody else. So I went home and did a harvest season with my dad and helped him out.

Jodi Souter:

I think it just gave me a little bit of time to think about where I wanted to go with my career and how best I could use my talent to help Canadian agriculture. And I just thought to myself, "What is going to make me most productive?" And I truly came up with the conclusion that that would be through a business and what better time to start than now.

Jodi Souter:

So I started as a contract plant breeder, did that for about three years and then rolled into what I call quote unquote, "independent plant breeding," which is just starting up a private plant breeding company. We still do some contract plant breeding for projects for specific crops or traits that say an end user or a farming group or whatnot would want. But realistically we're targeting and focusing on objectives in crops that we see will advance North American agriculture and be that kind of third lane in Canada that there are a few examples, but it's really not a well-defined lane yet, so we can help build that lane up.

Hannah Senior:

So what kind of traits are you focusing on then or traits and crops, are you focusing on?

Jodi Souter:

Yeah, so I say I'm a pulse and specialty crop reader. So I was educated in the pulses and have taken on quite a few specialty crops contracts. But what I look for is kind of

those gaps that are being left behind in crops. So we have a really well-defined government breeding program. We have a really well-defined academic breeding program in Canada, but they can do certain things that I could never do, right? Like I'll never sequence a genome as the example I use and they can do projects like that. Whereas being a private or independent plant breeder, we can do things that they potentially can't do. And it's that gap that we really want to fill in. It's the flexibility that we add.

Jodi Souter:

You know we can do things right away, we don't need to wait for approval and, and budgeting and funding potentially. So it's those sorts of things, I guess. And there's quite a few crops in Canada that are quite major crops that are considered minor crops in Canada or major crops in Canada, I guess, but around the world, they would be high acreage. So anything from a 100,000 acres, 500,000 acres, a couple million acres, they only have one plant breeding group working on them. And so obviously one plant breeding group can't focus on everything all at once, right? So a lot of those crops we're kind of focusing on as we can come in and be a second source of genetics and a second source of these traits for Canadian plant breeding or Canadian agriculture. Being that flexible body or company to fill in these gaps of plant breeding in these crops that need a little bit of additional time and energy spent on them.

Hannah Senior:

So you can react more quickly than a big academic type program. That's kind of one of your key advantages, have I understood that correctly?

Jodi Souter:

Yeah, absolutely. It depends I guess what system we run, but we don't have to apply for approvals to switch our breeding programs or whatnot, right? We can, we can react to the changing environment quite a bit quicker. So I think that gives us a little bit of an advantage there for sure.

Hannah Senior:

And you said that you trained as a pulse breeder and of course, pulses have seen huge amounts of interest in the last few years, as plant-based diets have become so much more popular. Is that one of the reasons that you chose that route and is it turning out to be an advantage that you do have that background?

Jodi Souter:

Yeah, it's definitely an advantage that I have that background, it is one of the hottest areas in agriculture right now. I don't think I selected it for that reason. I think I always wanted to work on crops that were up and coming. I always wanted my legacy or the work that I did create to help something kind of grow and thrive, right? So pulses are definitely an area where that can happen for sure. They're such an interesting body of

crops, right? I kind of got into breeding them because my master's, when I was in molecular biology was, was focused on nitrogen fixation. And so that's kind of why I started in pulses, but I think it was fortuitous, for sure. I guess I don't want to say that I masterminded it for sure, but it was kind of a fortuitous landing.

Hannah Senior:

And as I understand it, pulses are sort of historically underserved as a group of crops for plant breeding. Plus there's quite a lot of agronomic challenges around pulse growing, particularly, well certainly in the UK, I know that to be the case. And so does that sort of create a lot of both the direction of the work that you're doing and the challenges that you're trying to overcome?

Jodi Souter:

Yeah. I think there's room to grow in almost every pulse crop in Canada. Looking at the Canadian landscape, particularly I think that most, if not all of them definitely have their challenges and their obstacles and as they build and as they increase in acreage, that's expected. So definitely it forms a lane for us to go in and assist in innovation in those areas. For sure.

[Theme music fades in]

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 have dedicated their careers to plant breeding, helping us to more productive plants, greater food security and more sustainable agriculture.

Hannah Senior:

Now, back to the podcast.

[Theme music fades out]

Hannah Senior:

We met because we're both Nuffield Farming Scholars. And we were both at the contemporary scholars conference in Australia just before the world shut down on account of COVID. Can you give the listeners a little overview of what a Nuffield Farming Scholarship is, before we talk more about your specific scholarship topic?

Jodi Souter:

Yeah, so Nuffield Scholarship is a very unique opportunity to agriculture. It's a international scholarship body. There's quite a few countries in the world that participate. And so in Canada, we call it a mid-career scholarship for people in

agriculture that are expected to have more influence in their field with time, I guess. It really, all it is an worldwide study you a Nuffield Scholarship and you go on this worldwide study of a problem in your field or a topic, I guess. You pick a topic in your field and travel to wherever you need to travel in the world to go figure out or find answers or get a little bit of perspective on your topic of choice.

Jodi Souter:

And I guess I should thank the people that are sponsoring it because obviously for my project, it takes quite a bit of energy and money. So to Nuffield Canada, and then my sponsors are the Canadian Canola Growers Association, CropLife Canada, Canadian Seed Trade Association, and Sask Pulse are all doing what they can to make my project a reality.

Jodi Souter:

So, yeah, you and I met, I had started my travels. I started my independent study in Australia, and then you and I met at the Contemporary Scholars Conference, which is the conference that we all get together, all the scholars from that year around the world, get together and meet each other and discuss agricultural across the globe.

Hannah Senior:

Yeah, and it's a great opportunity. It can cover a huge range of different topics and interests. And for your scholarship, you're exploring opportunity and obstacles to Canadian plant breeding. So that's pretty broad. Can you unpack that a little bit?

Jodi Souter:

Yeah. Well, it's quite broad, so I'm probably going to have to narrow it down as I go along. But right now Canada's kind of at a fork in the road with plant breeding and there's quite a few different pieces that are coming into play that are really going to decide whether people like me can exist in the plant breeding world. We just signed on to UPOV 91 in 2015. So that gives us a little bit more control over our own intellectual property. And so we're trying to figure out the best way to utilize that, and in my case, build a plant breeding company under that framework and under that structure. And countries around the world like Australia and the UK, I think I can remember when you guys came on, but potentially like 2000, 2005-ish Australia came on in 2000.

Jodi Souter:

So obviously there are things that other countries that came on 20 years ago or signed onto UPOV 20 years ago, have figured out or have tried that potentially could help us speed up, signing it 15 years later than other countries around the world did. So that's a big one. That's a big part of my topic, but the other side is looking at biotechnology laws around the world.

Jodi Souter:

Canada, right now our biotechnology framework is hopefully going through some modernization and some responsible modification. And just what my project is looking at other countries in the world and their biotechnology laws and how potentially they're getting more opportunity to be innovative than what we are in Canada, and how that's going to affect agriculture in the next five, 10, 15, 20, 30, 50 years. And kind of building the case for some responsible changes to our plant with novel trait laws and regulations.

Hannah Senior:

And I have to just interject that UPOV is the French abbreviation for the International Union for the Protection of New Varieties of Plants. If you're new to that term and you go Google it, there's kind of quite a lot of pushback on you UPOV for restricting the rights of farmers and so on. And yet the way you described your background, you're, you're very much motivated by bringing better varieties for the farming community. So do you have a view on whether plant breeders rights are a good thing, a bad thing, for the farming sector, as well as for plant breeders themselves and bringing new varieties to market?

Jodi Souter:

Yeah, so I think one of the benefits of me, just as a person, as I have both of those hats and I wear both of those hats still to this day. I still am actively farming with my family farm, but I'm still actively being a plant breeder. And so I think I bring an interesting perspective and I think a lot of the time I played devil's advocate quite well, and sometimes, probably too much, people want to get me out of the room. But no, I think with time, it's a fantastic thing for Canadian farmers for several different reasons.

Jodi Souter:

Well, one of the reasons is it spurs innovation. It gives the ability for plant breeders to fund their own research and bring in funding from other places. Because now that we control our own genetics. I think it will give confidence to other parts of the supply chain to invest in plant breeding. And this way we can be more innovative and bring crops to the Canadian agriculture landscape that will make them more competitive globally.

Jodi Souter:

And I think it's tough for farmers to see because plant breeding is a long-term game. They can't pay us a dollar now and we'll have something next year, right? We are always looking 10, 15 years out into the future because that's how long it takes to develop these varieties, and then that being said, we have the ability to be more innovative. But with that, we have the ability to protect that innovation. So now we can go with plant breeders rights on a variety.

Jodi Souter:

The plant breeder defines what the purpose is, who it gets sold to. So when these genetics in the past have gone to wherever place overseas and became a variety there,

so all of the money that went into that innovation was lost to a competitor. Now we can be a little bit more protective over those genetics and keeping the money spent, helping the people who spent the money potentially.

Jodi Souter:

And it's not a new concept for people in other parts of the world. Like I've said, some countries have had it for 20 years, have been operating under that framework for 20 years. We're just kind of catching up and it's a change for sure. And so I think with any change, there's always going to be some pushback, but I think we'll find that this is quite an advantage for farmers in the end too. And our plant breeding rights laws in Canada were kind of written to try to make sure everybody benefited for sure.

Hannah Senior:

And I know because of COVID and it's been a dreadful year to try and do a travel scholarship [they both laugh] but from where you are now, from what you understand at the moment, do you think there are particular countries that are balancing this sort of set of interests well? The interests of farmers, interests of plant breeders, interests of people investing in new varieties, and places that aren't doing it so well.

Jodi Souter:

Yeah. Well, I think there're countries that we can definitely learn from. The countries that have signed on to these regulatory acts, I guess 10, 15 years ago, 20 years ago. And also with the PNT or plant with novel traits laws which are biotechnology laws. I'm looking at countries that have taken a different approach to those as well.

Jodi Souter:

So one of the big countries and the country that I was actively studying when we were sent home due to COVID was Australia. So they came on to UPOV in early 2000s, and their biotechnology laws are quite a bit different than ours. And so I think we'll be able to use them as a model of, we'll probably start seeing it quite rapidly here about how much more innovative they are in Australia than we are in Canada to use those two examples. And obviously Australia and Canada compete for some of the same export markets.

Jodi Souter:

How is Canada going to fare in 10, 15, 20 years when they have more competitive products than we do in Canada, because of the way that their plant breeding regulations were structured?

Hannah Senior:

I'm going to change direction and go to something you said earlier on, you talked about how sport has been a really important part of your life. And in fact, you said that you chose where you were going to study on the basis of sport. So tell me a bit about that. I

understand you were a competitive runner and has that influenced how you think about your business?

Jodi Souter:

Yeah. And so in Canada, we get five years of eligibility in our university sport and that's kind of what helped me choose to continue on into my master's program is after my undergrad finished, which is four years, I had another year of competitive eligibility left. So I started my master's because I had that one extra year, right, that I wanted to continue to be in university. Yeah, it was fantastic. And it taught me a lot of life lessons, but I think particularly now that I've started my business, I'm starting to recall a lot of those lessons that we learned in sport and are able to take them out of the context that I learned them in and now apply them to business. And I kind of chuckled to myself quite a bit actually, because pretty much every day, I'm kind of hearing the words of my coaches in the back of my head and variety development has nothing to do with distance running, right? They're pretty different avenues to take, right?

Jodi Souter:

But there's so many lessons that I learned in sport that I can apply in business in particular. And it's funny, I was listening to an Arlene Dickinson podcast who... Arlene Dickinson is a very successful Canadian business woman. And it was said on her podcast that, "It's inevitable that sometime during a meeting, a man is going to make a sport's metaphor." and I chuckled to myself because I guess I'm breaking gender norms because I'm that person that always uses the sports metaphors to try to get my points across because there's some very interesting, I guess, parallels between sport and business.

Hannah Senior:

Can you give me an example?

Jodi Souter:

There's kind of two different parts of business that I've really utilized sports, I guess sports references or what I've learned in sports. And one is competition.

Jodi Souter:

Right now in Canada I think there's kind of a fear of competition in plant breeding because the word competition takes on such a negative connotation and people don't want our plant breeders duking it out in the parking lot, right? And that's kind of, I think what they see, but competition from where I am has always been a positive. And it's one of those things that would you run as fast if you were running the race by yourself? Whereas if you go and put a couple people beside you, are you going to run faster because those people are beside you or are you going to train harder or figure out that you can break a barrier because somebody else has broken that barrier? And so that's

kind of how I see competition, as a positive and a lot of my competitors have been some of my best friends through my life, right?

Jodi Souter:

You go and compete on the track and then you walk off and you can go for a drink or clap each other on the back because when they break that barrier, it's going to motivate you to break that barrier. And I see that in plant breeding as well, competition is not a bad thing. So I see it as being a good thing. I see it as you can do competition very, very healthily. And I think more competition is only going to help if the people competing are doing it correctly or with the best intentions. So I see that kind of as is one way. And I think the other thing that it teaches me is a lot about motivation and how to motivate yourself, how to motivate others, what helps and what doesn't work and whatnot.

Jodi Souter:

And I think that's kind of where those lessons that coaches tried to teach us. And we thought we understood them, are really coming into play because now it's like, "Oh, I took that lesson." I again, pulled it out of the context that I learned it in and applied it in this situation. And now I see it from a different perspective or all of a sudden it takes on this other dimension and distance running is a struggle it's every day, you're just trying to get better and get better. And there is an end line in the race, but there's obviously no finish to how well you can do, like you can always get better. You can always get a little faster, you can always work and get, get a little more and you never really know what your capacity is. And I think that's in business too. And so you have to take kind of that same, slow and steady, continue to work, continue to build, continue to motivate because you don't ever know really what your capacity is in business. There's no obvious end point, right?

Hannah Senior:

That's some great analogies there. I mean, and the sort of importance of grit and you have a bad day, but you just have to keep going again. Pick yourself up and go again.

Jodi Souter:

Absolutely. And what you tell yourself and what you tell other people, and I've almost started to use sports psychology in business and it's I don't know. I think it's fantastic. Someone can do a TED Talk about all the ways sport and business parallel each other, but I don't know. I think all the lessons I've learnt from sport are really, really helping me in, in business for sure.

Hannah Senior:

Brilliant. That's really interesting. And it's really interesting as well, hearing you talk about it with such passion, it's clearly something that has shaped you enormously in the way that you've approached the world. So okay, tell me what has been the hardest part of your career so far, or perhaps what's been the hardest part of starting a business?

Jodi Souter:

Yeah, I think just starting it to be quite honest, getting over the fear of just starting it, I'm kind of a risk adverse person in general, which usually aren't the people that start businesses, but I think just taking that first step and I'm going to butcher this quote, but there's a quote that's about business that, "Although you can't see the top of the staircase take the first step." And so it's kind of a good visual and something that I did for sure. You know, the entire business for the next 30 years, isn't written out in stone, but you just have to get started.

Hannah Senior:

And what are you most proud of so far?

Jodi Souter:

For probably taking that step, right. Oh yeah. [They both laugh]

Jodi Souter:

I mean, it's been quite an interesting road and I was chucking with my sister, "That if I ever get famous, I'll be able to write a memoir." And I don't know how many people read memoirs about plant breeders, but it's been an interesting journey, I guess, realistically, like I think that's the thing that holds people back nothing's guaranteed, especially in plant breeding, right? And it's a massive risk and-

Hannah Senior:

Long-term.

Jodi Souter:

Long long-term risk and you can do everything right, and fluctuation in the markets can completely change your trajectory good or bad, right? So it's a tough thing to do is just to start.

Hannah Senior:

What opportunities do you see for the future?

Jodi Souter:

I think they're limitless and it's development, it's innovation, right? Like there's always going to be room for innovation, and agriculture is quite an old industry bringing it forward and bringing it into the next generation. There's so many things like we're just starting to get to the cusp of what's biotechnology and those kinds of tools and farmers are diversifying and countries are diversifying their imports and exports. And what consumers are eating is diversifying and there's always challenges and changing attitudes. And we get to produce to keep up with those challenges. So I think like very limitless opportunities, I think. In my Nuffield I kind of want to highlight that, but in

Canada right now, it's about making sure that we put our plant breeders into the position where they can take advantage of those opportunities and move Canada along with the rest of the world as quickly as possible.

Hannah Senior:

Tell me what's next for you and for J4 Agri-Sciences?

Jodi Souter:

Okay. So for me, I guess on Nuffield, we're kind of waiting until we can start traveling again around the world. And then my travel list is quite extensive and we're pretty excited to get going and go investigate some other countries in the world.

Jodi Souter:

What's next in the business is continuing to build up and find those gaps and find those key traits and objectives in crops that are going to help take them to their next level. And that's what I'm really excited about as a plant breeder is helping over the course of my career, take some of these crops and bring them to the next level. And I know it's going to take 10, 15, 20, 30, 35 years, but it's starting those dreams and starting to work towards those goals. That's keeping me energized and interested in plant breeding for sure.

Hannah Senior:

Excellent. Dr. Jodi Souter of J4 Agri-Sciences, thank you very much indeed for your time today.

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 find it by rating this episode and subscribing to the series.

Hannah Senior:

If you want to suggest people you'd like us to interview contact me on Twitter @PBSInt or on Instagram @PBS_Int. Until next time stay well.