



Bernadine Strik Oral History Interview, August 21, 2015

Title

“A Berry Expert for Oregon”

Date

August 21, 2015

Location

Valley Library, Oregon State University.

Summary

In the interview, Strik discusses her family background and worldly upbringing, noting her years living in The Netherlands, Australia, and British Columbia. She likewise recalls her earliest interests in horticulture and the progression of her studies and research as an undergraduate and doctoral candidate. From there, Strik describes her arrival at Oregon State University, her initial impressions of OSU and the Horticulture department, and the duties of her first OSU position as an Assistant Professor and Extension Berry Crops specialist.

A primary theme of the interview is the evolution of Strik's research over the course of her career at Oregon State. In this, she provides an outline of her early work on strawberries and wine grapes, her close and fruitful association with the North Willamette Research and Extension Center, advancements that she made in high-density planting of blueberry crops, and multiple investigations that she led on marionberries. She likewise comments on cranberry production, organic berry crops, the hardy argute kiwi fruit, and Oregon huckleberries. Throughout her reflections, Strik refers to the many connections that she has made in industry and her belief in the importance of the modern application of the land grant mission.

As the session begins to wind up, Strik shares her sense of pride in having receiving numerous awards for her research and teaching. She then details her current work on plant fertilization and nutrient management, and discusses the need to address global climate change. The interview concludes with notes on family and extracurricular activities, and final thoughts on the continuing importance of Extension and Experiment Stations.

Interviewee

Bernadine Strik

Interviewer

Mike Dicianna

Website

<http://scarc.library.oregonstate.edu/oh150/strik/>

Transcript

Mike Dicianna: Today is Friday, August 21st, 2015 and we have the pleasure to interview Dr. Bernadine Strik, professor of Horticulture at OSU. My name is Mike Dicianna, I'm the oral historian for the OSU Sesquicentennial Oral History Project. We're here in the Valley Library on the OSU campus. And we're going to learn about Bernadine.

We always like to start out with a short biographical sketch, items like where were you born, early family life and childhood experiences.

Bernadine Strik: Wow, that could take a while, too.

MD: Well there we go.

BS: Okay, so I was born in *Den Haag*, The Hague, in the Netherlands, and born to parents who were also in horticulture. So my father had a family that was on the growing side, various crops in greenhouses and in cold frames, and my mother was on the selling side. And my grandparents met each other through that relationship, so that was kind of cool. So of course, at a young age I didn't think that I would go into horticulture at that point. But we moved to Australia when I was about three, and it was because my dad had seen a movie about Australia and he thought it was cool. And so when I think back on that time of my parents just up and moving to a totally bizarre country, when you think about it, and not knowing a soul, what an adventurous spirit. I think back on that now and go "wow, could I have done that?" Because my parents were in their mid-twenties.

And so off they go to Australia, so I live there for six years - simply loved it, just the cultural experience. And then a similar thing happened when they were taking a cruise ship back to Holland to visit family. We stopped in Vancouver, BC in the harbor, and my parents and I were sitting in a coffee shop and a gentleman struck up a conversation with my dad. And at the end of that conversation offered him a job to design a golf course and become the superintendent of that golf course, which was something new for him, but kind of related to his horticultural background. And we moved to Vancouver Island. And that's where I spent my teenage years. I grew up with Dutch as my first language and Australian English as my second, and then I lost that accent as a teenager. I speak a little more distinctly, like perhaps a Canadian, at the moment. And all my education was in Canada. And my parents, they built - after the golf course they decided to go into the landscape and nursery business, so I grew up on a farm, on an ornamental nursery farm and a retail nursery. And then I decided to go on to university to get a higher education.

MD: And so basically you just kind of metamorphosed into this field, because you lived it?

BS: Well I did, but you know what it is about kids; they always think "is horticulture really what I want?" That was the question I was asking myself going, you know, I've grown up in forestry, in the ornamental nursery business, and I knew I wanted to do science, but I didn't know what kind. So I started as an undergraduate at the University of Victoria, so a wonderful campus and about an hour and a half drive from home, so not too far. I was young, seventeen when I started my university education. And I thought about maybe marine biology because of the location of the University of Victoria. It's well-known for marine biology. And then I thought maybe about pre-med. So I thought "let me take a whole bunch of general classes," as many freshmen do.

And I took a botany class that just turned my crank. And it did because the professor was the most inspiring professor, and Dr. Ballantyne is now retired, we still keep in touch. And he got me so excited about plants and research, and obviously more than the practical, because at home I had the practical side. But he got me excited about whole plant physiology and plant structure and function, and he actually offered me an opportunity to do an undergraduate thesis, because he thought I had potential for doing research. And he was a hobby scientist too, breeding rhododendron, and he still does in his backyard. And he was the one who encouraged me to really switch my focus to plants. He basically injected me with that passion.

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And so then I switched to plants and got my degree in botany at the University of Victoria with an honors. And he did one more things that I wouldn't have even thought of; he encouraged me to take an exam for the NSERC scholars in BC.

So then, National Science and Engineering Research Council of Canada offers two scholarships per year per province in Canada, and you have to take a test. So the top two achievers get a scholarship that pays for their entire education, including living expenses.

MD: Wow.

BS: And so he encouraged me to take that test, because he knew that I was interested in going on to a masters to do research. Without his encouragement I wouldn't have taken it, and I got one. And so I was able to pretty much choose my advisor and my university for my masters, and that's what led me to the University of Guelph in Ontario, Canada. And I chose a wonderful scientist to be an advisor, a pomologist, Dr. John Proctor, who I still keep in touch with. And I chose a project on strawberries because that was of interest to him, so he found something that interested both of us. And that led me to Guelph.

MD: Yeah, the Guelph Griffins.

BS: Right, what a bizarre mascot.

MD: Oh, I know. They have a wonderful statue of this griffin.

BS: And it's a gorgeous campus too, really old school. And I would say it is recognized as the best horticultural institution in Canada, and that's where I wanted to go.

MD: Yeah, to have the...

BS: Right. So my parents, when I talked about this, they have always been incredibly encouraging and supportive. And I'm an only child. And so when they realized I was going onto an advanced degree in horticulture, I'm sure it was sort of mixed news to them because I could have inherited the family business, which was very successful. And so instead they decided to retire, and they were so excited to see me go on to a graduate degree and couldn't have been more proud to see me take maybe horticulture to a next step.

MD: Yeah really, because I mean it's nursery work, that's the greatest part of that, but you're affecting the final product-

BS: That's right.

MD: -with the biology. And that's neat. Now I notice that you also had a plant breeder mentor that Hugh Daubeny, Daubeny?

BS: Daubeny, yes.

MD: He was with the Department of Agriculture there in Canada and he invented the Totem strawberry, which are grown here now.

BS: That's right.

MD: And so—

BS: An amazing man.

MD: Now did he have any significance in your graduate work, too?

BS: He had actually a lot of significance, not just in my professional life but also my personal life. So it's a really fascinating story, how some of these things come full circle. So I first met Dr. Daubeny when he came to give a guest lecture at the University of Victoria in a plants and man's [?] class taught by Dr. Ballantyne. And what an incredibly enthusiastic man; berry crop breeder extraordinaire. And he said "you know, you need to not work on ornamentals," because he and Dave Ballantyne are very good friends, so they were teasing each other. Dave Ballantyne wanted me to go into ornamentals and Hugh Daubeny into berries, and they were teasing each other saying "no, berries is where it's at."

And so what was funny about that, I had no idea that I was going to be doing research on berries at that time. So when Dr. Proctor had a berry project for me and I started my masters working on strawberries, he said "we need an external examiner for your PhD committee." In Canada that's what they're called. And I said, "Dr. Daubeny is who I want." So he agreed to be an external examiner on my PhD, and he ended up coming to my PhD defense. So I started a masters at Guelph and then after about a year and a half I was asked if I wanted to transfer to the PhD. So I ended up switching to a PhD, which wasn't really common at the time. Not a lot of students had that opportunity, so I was really honored, but it was also a little scary, because if something happens, you don't have a master's either.

MD: Yeah.

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BS: But I was fortunate because I was able to actually get my PhD in four years, and without a masters. So I had a PhD at twenty-five, so that was nice.

MD: Yeah, this was in 1987 through that university, and that's also with distinction. Now did this form some of your goals and aspirations of what you wanted to do with this freshly minted PhD?

BS: Well, I already knew. I'm a pretty driven person and so after about a couple of years I started thinking about "okay, what am I going to do with this degree?" And so I thought, "there's lots of options." There was the berry crops professor there, Dr. Evans, he retired and so they needed someone to teach his class. And so I stepped up to the plate to do that, as a PhD student. And so I changed his course a bit and gave it my take and taught that for a year. And so that got me kind of excited about teaching, and I thought "well, I'd really like to do that." So I had an opportunity, I was kind of offered a position, or encouraged to apply for a position at McGill in Montreal, but I would have had to leave my PhD program and I didn't want to do that because that would have limited my options beyond that.

So I decided that maybe teaching is for me, and then I thought about a professorial position, either in Canada or elsewhere, and I realized that I really wanted to do research but I wanted it to be practical, because I was enjoying the research. So I thought, "what kind of position can I tie my background for farming and working in industry to research and teaching?" And I thought, you know, maintaining that contact with growers was really important to me, and in Canada they don't have an Extension program like they do here. And so I thought if I really want to do something that involves Extension, I'm going to have to look at positions in the US. And so as I was finishing up the PhD in the last year or so, I started really actively looking for positions. And keep in mind I was coming at it from the viewpoint of here, Canada, the federal government in Canada had financed my entire education with no strings. And so I was really seriously looking at positions in Canada, but there were none. And that was really disappointing and really telling about, perhaps, where Canada was moving in terms of AGCanada.

And so I thought "well, I better seriously look at the US." Because the difference here, and what I think is such a strength at an institution like OSU, which is the land grant institution, is that three-legged stool; the close relationship between teaching, research and Extension. And you can't find that at any other institution that's not land grant. And certainly not in Canada where extension is part of the Provincial Ministry working with growers, and they're distanced from the universities. So that didn't appeal to me very much, in terms of having extension. So I either had to stay in research and teaching in Canada, if I could find a position, or look for what I really wanted, which was an extension, research, teaching-type appointment.

MD: Now the Pacific Northwest, was that a target because of—

BS: That was my dream, was to come back to this region. We had traveled extensively worldwide and in the US as a family. That was a real blessing, that my parents enjoyed that and could take me with them, and I had a really, really good view of horticulture worldwide as a relatively young person, and where I might want to live. And my parents were still in Canada, and still are in BC, and so I kind of ideally wanted to come back to the Northwest. I love this area. But I was willing to work anywhere because obviously I needed a job. So what was funny about starting here was that I had applied for two other positions here that were open. Early on in my PhD I had applied for a tree fruit position and—we laugh about it today—that Anita Azarenko was hired for, and I applied for an ornamentals cold-hardiness position that Tony Chen was hired for.

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And they were really early in my PhD. I was like, at least almost two years from finishing, but I wanted to get my name out there. And so I was interviewing or applying for jobs earlier probably than I should have. And when I saw the job that I am now in advertised, I thought "oh my gosh, this is like my dream job." And it was a position to refill Dr. Ralph Garren's job. And he was one-hundred percent Extension and it was one-hundred percent berry crops, including wine grapes, which were a relatively small crop at the time. And when the position was advertised I thought "oh my gosh, here's another one at OSU, about a year and a half after the ornamentals and tree fruit one, and this is right up my alley. "My PhD was on strawberry whole plant physiology, so I thought, "this is great." And I was about eight months from finishing my PhD, so I thought, "I'm closer now, so let me give it a try."

And I was offered an interview and so I thought, "oh my goodness, this is great. At least this will be a wonderful experience for me." This was my first interview as a graduate student. And so I didn't have any experience and I thought, "at the very least I'll get that." Dr. Hugh Daubeney was a reference for me for that position, and of course he knew all the players in the Northwest, was a great choice as a reference, I'm sure. And of course my advisor and others. And I'll never forget when Dr. Pat Breen, who's now retired, a small fruit physiologist at OSU, was on the selection committee for this position. I will never forget when he had the opportunity to see me at an ASHS meeting where the job was being advertised. He came up to me and said "do you want any job, or do you just really want to work at OSU? 'Cause I've seen your name in three positions now. You have applied for three positions." And I said "I really want this job, but I also love OSU, what I've learned about it." So I got the interview and it was an incredible experience, especially as a young person coming here for that.

MD: Yeah. Now, so you started in '87 here, and what I show is that you were an Extension Small Fruits and Viticulture Specialist, and so did you have experience in the wine industry? I mean it was—

BS: Yeah, no, not at all. Other than through teaching that course at Guelph. I was quite savvy about berries of course and I did my due diligence, I did a lot of homework about the berry industry here, as any good student would do coming in. Some don't, surprisingly enough. But so I knew a lot about the industry here. It was, and still is, *the* place to be for a production system physiology researcher, because we have almost twenty-four thousand acres just of berries, and then we have maybe sixteen thousand acres of wine grapes here now. So in terms of the diversity and the importance of berry crops, the climate, it is *the* place to be. And we have a great team of people here, and we did; the team was smaller at that time but I thought, "wow, what a place to come." And there are great collaborative relationships between WSU and AGCanada in Vancouver. And so that's why Dr. Daubeney really encouraged me to apply and to not be afraid of being green and not finished yet.

And so I interviewed in the summer and got offered the job in the summer but I hadn't finished my PhD, so I didn't start until September 1987, and probably did the fastest writing on a PhD thesis than most students would be able to do. So it was one-hundred percent Extension, as you said, small fruit viticulture position. The first thing I did was get the name changed, because I got really tired of being introduced as the Small Fruits Specialist, with a pause. And so I decided, look, berry crops is way more descriptive than any small fruit, like a cherry is pretty small. So I got—I became the Berry Crops and Viticulture Specialist. And my department head at the time, Dr. Conrad Weiser, "Bud" Weiser—

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MD: I know him.

BS: Great boss. One of the things I've joked about in talking about my hiring was when he called me. He asked me if I was interested in the job, and the reaction he got from me he still thinks about because I literally - I wasn't really good at playing poker, because I just let out a big whoop, and it probably wasn't good from the negotiation standpoint. But I thought boy—later I told them "boy, to have your first boss in a professional job be a "Bud" Weiser," I thought "what could be cooler than that?" So great boss, great administrator, great mentor in that respect. And he and I sat down pretty soon after I got hired and I said "look, I'd really like to teach, and who better than to teach undergrads and graduates about berry crop production and physiology than a specialist, rather than a more basic researcher."

So he didn't turn that down, he thought that was great, and often they're looking for people, more people to teach who are interested in that. And so pretty soon after I was hired my position was changed to an eighty-five percent Extension, fifteen percent teaching. And so it stayed like that for quite a while. But what I found was frustrating was I didn't have enough opportunity, particularly for resources, time and money, to be able to advise as many grad students as I wanted and to do as much practical research as I wanted.

MD: Not enough hours in the day, days in the months, yeah.

BS: Yeah, and so I actually asked and expressed interest in switching to that insane appointment of a three-way split. And they wanted me to stay a specialist, which meant I had to be at least fifty-five percent Extension to serve as the state specialist, and so it changed to fifty-five Extension, thirty-five AES, or research, and ten teaching. And so that's what it's been ever since.

MD: Spread thin.

BS: Spread thin.

MD: Yeah.

BS: So it's been quite a ride. And so I ended up then becoming, in many ways, a colleague of Dr. Daubeny, which was just a thrill for me. And he ended up introducing me to my future husband, Neil Bell. And so it's rather hilarious because Dr. Daubeny claimed tremendous credit for my professional life, but also seemed to claim credit for our kids, which was rather fascinating. So he passed away recently and I was able to do a presentation at the International Society for Horticultural Science Rubus and Ribes Symposium just this past June in North Carolina. And we dedicated the proceedings of that meeting, the *Acta Horticulturae*, to him for all his accomplishments in rubus, which is raspberry, because he also released Tulameen raspberry, which was the premiere worldwide raspberry grown and still is grown in many, many countries. And so he had a tremendous influence in the International Society for Horticultural Science.

And so I gave a presentation about him, about his life and his accomplishments and his family and his influence on myself as well as many others. And it was a very emotionally difficult thing to do, but it was quite an honor to be able to do that. So it's kind of, in that sense, come full circle.

MD: Yeah, full circle.

BS: Yeah.

MD: Well one of the things that I turned up was that you, early on in 1988, had an opportunity to travel to Italy for an International Strawberry Symposium, and you toured European producers.

BS: Right.

MD: Now what I'd like to know is, are strawberries kind of a global thing, or—

BS: Yeah, worldwide if we look at berries, strawberry is the number one crop grown worldwide. Oregon's a pretty small player in strawberries; California is a huge player. So when I started it was logical for me to hit the ground running on strawberries because that was what my PhD was about. And the industry was so supportive; the Oregon Strawberry Commission actually helped pay for my trip to this international meeting. And I came back with information about what was going on, and they were doing some research on machine harvest, which we've had ups and downs on in Oregon, to try and reduce labor costs.

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And so it was a tremendous opportunity. And it was my first ISHS meeting, and now I'm actually on the executive board of ISHS after my twenty-eight years of involvement with ISHS. And strawberries is kind of a real emotional crop for me because, you know, of my PhD work and starting in strawberry research here in Oregon, and there's a lot of emotional ties to strawberries in Oregon. But it was soon after I was hired here that my parents were looking at some older photographs

they had and they found one of my grandfather, my dad's father, and apparently he was one of the first growers in Holland to grow strawberries for off-season production. He was growing them in glass frames before, during and slightly after World War II, and then selling these strawberries as individual fruit. And now offseason strawberry production is quite common worldwide. And so to see this photo, it was really emotional for me to think about, wow. He passed away before, when my dad was a teenager, so I never met him. So to think about "wow, I've come full-circle, I'm actually working on a crop that my grandfather was a pioneer in."

MD: Wow, that's incredible. I mean the whole—it's in your blood. It's in your DNA.

BS: It seems to be, it seems to be. And so it's really neat when I think about working at OSU, because when we look in the 1950s here in Oregon, there were eighteen thousand acres of strawberries grown here, and a lot of strawberry production was in the Hood River region and they were shipped fresh by rail to more populated areas. Of course that's not done anymore. And then we had a lot of production in the Willamette Valley that was canned. And so we were the leading state in strawberries here in Oregon in the '50s.

MD: Wow.

BS: But when California started growing their annual strawberries with a very high-yield per acre, we couldn't compete. And so now we're down to about two thousand acres. We cling to it as an emotional memory. Many people here grew up picking strawberries.

MD: I did.

BS: Yeah.

MD: I got fired after about a week for throwing them, but yeah.

BS: It is backbreaking work. I have tremendous respect for our harvesters, our laborers that pick strawberries and do it so well, because it's incredibly tiring work. And now we still grow these premiere strawberries that have incredible texture, aroma, flavor, color inside and out, and they're used predominantly for their premiere products, or these high-value products like specialty ice creams. And our growers work hard to make money growing strawberries, but there's a real attachment to strawberries. And so I still do some work with strawberries but we have berry crops that have become much more important in Oregon, like blueberry and blackberry.

MD: Yeah. That's one of the things that early in the 1990s, you focused on the ground up to caneberries.

BS: Yes.

MD: And is that kind of a relationship with this industrial change within the California and—

BS: I think so—

MD: Your focus kind of moved up the vine a little bit.

BS: Yeah, I think the challenge with a job like this is that when you—especially when I started—when you work with a rapidly growing wine grape industry, when you work with crops that are rapidly growing like blueberry and crops that are already very important like blackberry and you've got cranberry on the southern Oregon coast - I mean you've got these diverse, all high-value, important crops - is that you need to do some work in each of them because you really don't want an industry upset with you because you're not giving them attention. At least I didn't.

So I had to learn very quickly to juggle a lot of things all at once. And you often too go where the research money is. So some of where I've morphed over time in these twenty-eight years has been related to, where is the research money coming from? And the industry understands that, and they certainly appreciate when you're using federal money and they don't need to spend as much to do these really in-depth projects. But probably in wine grapes the biggest things were helping new growers, because the industry was growing so rapidly. We have a wine grape industry where we have incredibly intelligent people who are getting into wine grape production. Some may be farmers, but some not. We

have incredibly bright, knowledgeable growers that may know more than a specialist, and yet we have those who know nothing.

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And so it was an industry where I really had to help the newer growers in particular, until the plague hit us, which was phylloxera. And I have the dubious distinction of helping identify grape phylloxera in 1990. I was still working with wine grapes, and that was, to put a terrible analogy on it, but the industry used the analogy of it's like AIDS. It was, people didn't want to tell other—a vineyard that got it didn't want to tell another vineyard, or they were afraid they wouldn't get pickers, they wouldn't get pruning crews, they wouldn't be able to sell their fruit. And so there was so much fear at the beginning. And we didn't have an entomologist at the time that was able to work on the crop. And I'm on the insect pest, excuse me, and I was willing to do what I could. And so we got a student, a master student, and we learned a lot about its lifecycle. And so a lot of what we were doing were Extension programs at that time, to help the industry with phylloxera.

And so that information on root stalks—I mean this is a worldwide pest. It was its first time having economic impact in Oregon, so it was a classic Extension thing to do: learn about it from elsewhere, see how it's different in Oregon, develop educational programs, get away from this fear, have growers and wineries working together. And we as a team effected a big change and really helped the industry get through that. And it wasn't soon thereafter, a couple years, that I ended up just focusing on berry crops and we hired a dedicated viticulturist, which was great for the industry.

MD: Yeah, because the wine industry in Oregon is huge.

BS: It's huge, yes.

MD: And so that's what—I was wondering about whether you would get away from that when it got to be a little bit more specialized because of the industry growing so much, yeah.

BS: Right. Yeah, and a lot of this job is—what's difficult about this job is you have all these ongoing projects; research, Extension. Otherwise you've got all these crops to work with, and then you get these brushfires that you have to put out. You're the go-to person. And phylloxera is an example of that. But we've had that in every single crop that I've worked with where there's been something important that someone needs to take the leadership role on.

MD: And that's been what Extension's all about for a hundred years.

BS: Yeah, absolutely, and that is such a valuable thing for the industry, huge. And that's one of the reasons I wanted to work in Extension and why I'm so proud of being a specialist. I've been here twenty-eight years and I love this job just as much, if not more, as when I started. And I've had job offers and heavy solicitation to come to other—to try and pull me away from here. And I've been tempted on a couple of occasions and OSU has stepped up to the plate and industry has stepped up to the plate to tell me what I guess we all need to hear at some point, which is "you're making a difference. Stay, please." And when industry got together and said that to me, that was the most moving thing for me and my family to hear that, that it was like, you know, I really don't want to go. I want to stay here. Why would I want to leave a job like this where I feel—I'm hearing I'm making a difference? It's not just me feeling like I'm making a difference. And that's what I've always wanted to do, is to make a difference.

MD: Yeah, what more could anyone hope for?

BS: That's right, that's exactly right. And so to have a job where every day is different, you can influence students and help them become successful. That's been a really satisfying thing, to now have graduate students that have gone on and now have their own graduate students. It's the coolest thing. And to see them go on into industry positions where I'm continuing to work with them. You know, many of my students are extremely successful in industry positions with big berry companies and they're doing research and working with growers, and it's so rewarding to see that.

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MD: It's kind of a lineage.

BS: It is, it is.

MD: And you're just part of this—

BS: That's right.

MD: Dating back to your grandfather. I mean that's—

BS: That's right, that's right.

MD: So in the early '90s and '92, you're part of the berry crops research program at the North Willamette Research and Extension Center, the NWREC.

BS: Right.

MD: Now that's up in Aurora, so there's a commute there. Now how did this work?

BS: Oh, I wasn't sure it was going to work. It was a situation where the superintendent at North Willamette, Dr. Lloyd Martin, was also the berry research program leader there. He had a fifty percent administration appointment, a fifty percent research appointment. And he took another position as the department head in Arkansas. So when he left they weren't sure how to do this, because many administrative positions are one hundred percent. And that's what they ended up advertising, with a small potential discipline appointment, and the odds of that being berry were pretty slim. So they had to decide whether they could afford, under tight budget times, to hire a new berry crops research person. And that's what I was hoping they would do, because Pat Breen was retiring also, and he was a whole plant physiologist and a wonderful colleague. So his position wasn't being refilled as a berry position, so we were really being cut in research FTE, so to speak.

So they asked me if I was willing to do it on an interim basis first, which is always a sure sign that things might be moving in that direction. So I agreed, and it is quite a commute from campus to the research station, depending on how—and I like to kind of drive fast, so for me it's about an hour, now a little longer with traffic. So I agreed to do it, work with good research assistants that were already up at the station, that had been hired by Lloyd.

And the industry was very supportive of me doing this. And it was about the same time they were going to hire a full time viticulturist, so I couldn't afford to do grapes. There was just no time. It's *the* place to do berry research, because of its location. It's the jewel of the Willamette Valley experiment stations. It's just ideally located for many of our berry crops. And so I thought, "here's an opportunity to do research under ideal soil, really well-located for industry exposure."

And really my goal was to take that program and morph it, expand it and make it the premiere berry production research center in the world. And that was my goal, and I thought "you know, I can do this." It's not too far for graduate students to do projects there. And so after an interim period I got asked by industry and administration if I would do it full time, and so I changed from a three-way appointment to a three-way appointment with two offices. So it was - and I wouldn't wish this, because it's a lot to juggle, on a new position - but having already been tenured I thought "you know, I can tackle this." And I got promoted in '97, so it didn't seem to slow me down in that respect either, fully promoted.

MD: Yeah. Now, the NWREC is in Aurora—

BS: Yes.

MD: I've looked at it on Google Earth; it seems to be rather large.

BS: Yes.

MD: Now, what's the history of that facility? Is that one of the early Extension—

BS: It is. I don't know if it's the earliest—

MD: No, I don't think it was—

BS: The land is leased from Clackamas County, it's a hundred and sixty acres, I believe it dates back to the mid-'50s. So it's a hundred and sixty acres and the three main areas of focus, historically, were berry crops, vegetables and ornamentals. And since then there have been more areas of focus added, especially since Extension faculty are now housed at the North Willamette. It used to be the North Willamette Experiment Station.

MD: Right.

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BS: Just research. So it's really, it's kind of exciting. And one of the things I always wanted to have happen was a close link with Extension and research. And then at the station that's exactly what happened, Extension faculty became a part of the faculty at the Experiment Station. And I think it really enriched the location having Extension faculty that work on pest management, entomology, diseases. We have a berry crop Extension faculty person there, we have nursery people, and there's just this close link, and industry can come there. We now have a small farms program there, we have some urban horticultural programs there, and it's really expanded under some really good leadership, especially recently. So it's just become an excellent experiment station, and I think the industry sees that also. So in that sense, it's just really gratifying having an official appointment there also.

MD: So you became – well, about the same time you were an associate professor in horticulture, and so you were still teaching and working with people.

BS: Right.

MD: And then, so you're still published. I mean you've been an Energizer bunny when it comes to publishing anyway, but you continue your research and publishing and teaching and all this.

BS: I did.

MD: And it must have a whirlwind, but what were some of the early research projects that you were doing there?

BS: I think there's a couple that have had huge impact. I think—that's funny, it's the first time I've been called an Energizer bunny, but I think people who know me I think probably would say that's a good description. I'm a very high energy person and I work really hard and I'm very efficient doing things, and that's a learned trait. Some of it's a personality, Type A type personality, but it's also a learned trait that's an important thing to learn in this type of job.

So some of the really important, high-impact research was, when I first came to Oregon, I saw that blueberries were being grown. I didn't know a lot about blueberry production, and blueberries were being grown at a four foot in a row spacing, ten feet between row spacing. And they take a good eight years to be mature and they're first yielding in about year three after planting, and yield increases up until year eight and then it's pretty stable. And I thought "boy, these are big bushes, touching almost in the row middles," and machine harvest was just starting to become popular for blueberries for processing, and about half of our production was being processed.

And so I was visiting the growers and saying "why are they grown like this? Why not tighter in the row so the bush will be smaller?" and they said "well, no one's really done that. We've always planted them this way." And I said "well, I think it would lead to earlier production, but I don't know," I said, "what impact it would have when they're mature. So it's going to need to be a long-term study to kind of see if we need to maybe take out every other plant, was what the industry was wondering. So I submitted that as a research proposal as a long term study - and they're hard to get funding for - because I figured it needed to be an eight-year study almost on high-density plantings and trellising and blueberries. And it got funded by the Oregon Blueberry Commission and they said they were committed to funding it for the life of the planting.

So I established that, a one-acre trial at North Willamette, which is a very visible spot, so I could show it to the industry at Field Days. So we have annual Field Days where they come and see our research. So we were about four years into the study and it looked so good the industry said "I don't need eight years."

MD: Yeah, "this works," yeah.

BS: Yeah. And it's funny because we always pride ourselves on the importance of getting outcomes out to the growers so they can use our information. And I'm a bit of a conservative, cautious soul. Having been raised on that family farm I need to know, is it going to be economical? What are the cost-benefits? Because high-density costs more to establish and to maintain. And so we were three or four years into the study and the industry kept going "man, this is looking really good," and I said "but I need to wait, see what happens when they're mature," and, "yeah, yeah, we realize, you keep going."

MD: We're going to [laughs].

BS: Right. So I was already getting the message out. But we have the world's largest blueberry nursery here in Oregon, and to be fair our results looked really good. But on the flipside of that, and they all smile when I've said this to them, I said "boy, it really helped that you were sharing this information, because high-density plantings, that's double the plants per acre. That's selling a lot more plants. So you have a lot of incentive to help me share the info," and we were joking about this at the time. But it's true, when you have the world's largest blueberry nursery selling all over the world, not only does your research get shared locally, it gets shared worldwide.

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So to make a long story short, the outcomes were really positive, and very quickly the industry switched to higher density plantings at two and a half feet or three feet. That increased early returns for growers, and they paid for the plants very quickly. Plants reached mature yield much faster and are yielding about the same, but were yielding more much faster.

MD: Yes, twice as many plants.

BS: And at the value of blueberries, that made a huge impact. The other thing I was doing at the time was trying to keep the bush narrow so we would recover more fruit when we were machine harvesting, so less loss on the ground. And a simple trellis that costs five hundred dollars an acre increased recovery by eight percent, so we were able to pay for the trellis in the first year. And that got adopted worldwide also.

MD: Wow.

BS: So that's research that very quickly got adopted, continues to have an annual impact, and is something that I think I'm recognized for in northern high bush blueberries throughout the world, as being the one who did that work. And that was funded by our industry. So that was a really rewarding project.

Now there's another one in blackberries. So marion is our signature blackberry.

MD: Yeah, now is that a Northwest thing?

BS: It is. So that is a blackberry bred by Dr. George Waldo, and from the USDA-ARS and OSU Cooperative Breeding Program, which has a long history dating back to 1916, probably the only cooperative program of its kind worldwide. And we still have that cooperative relationship, and I guess I can come back to that later. But that marion blackberry was tested at—the cross was made by George Waldo, it was tested heavily in Marion County, so it was named after Marion County, and it got commonly named marionberry, even though the variety name is marion. So marion is a trailing blackberry and it is still the most importantly, on present acreage, most importantly grown blackberry. But there's a lot of new thornless ones that are being heavily planted, so I don't know how long that's going to last.

But it's certainly, it's our state berry, it's widely associated with Oregon, it's pretty much almost only grown here. There's a little bit of it in Chile. But it's really well-adapted to our region. Its downfall are two things; one is its sensitivity to winter cold damage, so it has fluctuating crops and fluctuating prices. So a lot of research I did early on in the eighties was related to how can we maximize cold injury—cold tolerance, excuse me. So I had graduate students working on that project and we were able to help the growers with that through cultural practice. So that was good news, until we breed a more cold-hearty marion-flavored blackberry.

And then this other downfall is it's very thorny. So the industry approached me and said "we're having problems with thorns in the machine harvested product." So the processing plant said "look, we had one or two processors go out of business due to liability lawsuits" where people were eating, let's say a pie, and a thorny leaf stem would end up in the pie

and they would sue. And you know what our world has come to, it used to be you could give someone a lot of frozen fruit and say "I'm so sorry," but now it's millions of dollars, perhaps, and companies go out of business. So they asked me to see if we could figure out a way to minimize the risk of thorn contamination in machine harvested marion. So we have an exceptional machine harvesting company here, Littau Harvester in Stayton. So a local company, they're still the most common machine harvester used in our berry fields in Oregon, and I worked with them, I worked with key growers and processors.

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So we had this team and we brainstormed what can we do. And we came up with brushing the plants in the winter, because the thorny contaminants are last year's leaves and they don't drop off the canes totally. And so they're hanging there, so when the machine harvester goes over the plants next summer they drop into the fruit, and the fruit is so juicy it stains them purple, and they're really hard to see in the product. So we equipped, found a way to equip the machines with these brushes and brush the thorns off in the winter. And the machine company Littau developed the brushes, we tested them. So it was a brainstorming idea. We did replicated research in grower fields to make sure it worked, and that led to now custom brushing. Most of the acreage is now, on thorny cultivars, is custom brushed in winter to minimize thorn contamination, and it obviously works.

MD: Huh. Yeah, so these are practical—

BS: Practical, innovative things.

MD: That our research, that OSU has had.

BS: Yes, that's right.

MD: You know, that makes you proud to be a Beaver, it really does.

BS: Absolutely right. And now we've tried to get at that through our berry crop breeder—and I say "our" fondly—he works with the USDA-ARS, Dr. Chad Finn. But he's now the breeding side of the ARS piece and I'm the OSU cooperater side, the horticulturalist. So we have a wonderful cooperative relationship and we've released lots of new berry crop cultivars, including more cold-hardy, thornless, grape-flavored, new blackberry cultivar, and the newest one is Columbia Star, and it's being heavily planted. And so we affect change through different ways, culturally as well as breeding, and so it's a really exciting job.

MD: So you work with the breeders and they're at the center up there in Aurora and plant the new cultivars and see how they'll do and look at them from a physiology point of view.

BS: Absolutely. So we—generally the OSU horticulturist's role, and a lot of this is done in North Willamette, is, well Chad will make the crosses and a decision on what's going to produce hopefully the best children, so to speak. And he tests all the siblings, selects the best ones. And the ones that look promising, the more advanced selections, are tested at the station, research station, compared to present cultivars in all of our berry crops. And then the most promising ones goes to grower trial on a bigger scale, see what the growers think. We get lots of input, we work closely with Food Science to see how well do they process? Because a lot of these berries are processed, and the industry provides input on which ones - blind comparisons often - which ones do you really like? And that goes into the mix, and then the best rise to the top and are named and released as new cultivars. And hopefully by then we have some good information for growers on how to best fertilize and grow these.

MD: And you publish on all this stuff, all the way through.

BS: Absolutely.

MD: So you're not only in scientific journals but practical industry.

BS: Absolutely. So what I've really found is you need to have that whole continuum. So as an Extension person it is so important to have practical Extension publications. And I also take great pride in providing support to the Home

Horticulture Program, because that goes back to my background in the retail nursery. They need good information. And I enjoy doing training in the Home Hort program, and I could probably very easily give that up but I don't want to. And so, including the Home Horticulture Extension, I have fifty-two Extension publications that I've done so far in my twenty-eight years. And they're, I'm just as proud of them as my scientific research papers.

So the hundred papers I have so far are refereed papers, and those are important because it builds the base of knowledge for other students to use, other colleagues to use to learn more about these crops. And it's an affirmation that I'm doing innovative work - that's what "refereed" is all about. But in between are proceedings articles, industry articles, newsletter articles - putting all this in less-scientific terminology and getting it where it's more easily understandable - and synthesis papers, and those are really critical, book chapters. They're really important so that your information can be used more readily.

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I mean, other examples would be nitrogen fertilization management. I've done that in pretty much every berry crop that I've worked with from cranberries, strawberries, raspberries, blackberries, blueberries. And it can be a very basic piece, which is using a naturally occurring isotope of nitrogen, a special fertilizer that growers can't get but we can, as researchers. We fertilize the plant, we can tell exactly when it's taking up the fertilizer, where it's going on the plant, how much is being taken off in fruit, how much is stored in the winter and where, when is that stored nitrogen used. And so using that as a tool and publishing that research to learn more about plant needs has helped us develop fertilizer programs where we've modified how much is put on, so we have minimized cost for growers but also potential for groundwater contamination. And we've also been able to better time it so that they get better growth and better quality and less chance of losses. So that's the real practical side.

MD: I know that Extension has done for this for a hundred years, but to have it put into this perspective of what it does for industry today and how we affect that is really special. We've talked about blueberries and marionberries a little; let's talk berries a little bit. I'm very interested in cranberries. You wrote, in 2002, a book about cranberry production here in the Northwest. I mean any crop that's harvested in a flooded field just is fascinating.

BS: It is fascinating.

MD: And now, are we leaders in cranberry production?

BS: Not—we're very important in cranberries. I think we still rank about fourth in cranberry production. I mean the big players; Wisconsin, New Jersey, Massachusetts. But Washington and Oregon have a very similar kind of production situation. They're grown on the coast in this kind of upland soils, sandy, low PH soils, cranberry beds. They're not really bogs for us because they're not peat bogs like they are in BC or in Canada or in the northeast. And so they're constructed beds, very specialized, with dykes built and ditches around and good drainage, they need very good drainage. And they have, the soils that we have in Oregon—in Coos and Curry County is where most of our cranberries are grown—is a semi-permeable layer of this subsoil, and that allows this sandy soil to be flooded so that the flood doesn't drain too quickly, and that's critical for cranberry production. So prunings are used to establish a new planting, so when a grower prunes they can sell if they have a good cultivar clone. They can sell their prunings in bales, for a price obviously, make some money on prunings, and then the new bed is established in winter by cutting these prunings, just pushing them into the sand. It's basically in-field propagation.

MD: Wow.

BS: And in a few years they start producing and yield will increase and then they can be harvested by one of two methods; a dry method, which is basically fingers pulling up the fruit and pruning them at the same time and then they're put into bags, and that fruit can be easily used for fresh. We have quite a few cranberry beds that are selling fresh cranberry fruit under a private label.

And then we have flooding. Flood harvest is what most people see, and that is the coolest thing. To go—anybody who wants to see this, to go to the Oregon Coast or Washington Long Beach area, see flooded cranberry beds generally in October, would be a good time to see that. And they flood with water to just about maybe six inches, a little more, above

the top of the cranberry canopy, and then they drive a machine called an egg beater, which is basically like a sternwheeler wheel in front. And then they carefully cover the entire bed and the agitation of the water causes the cranberry fruit to pop off the vine and float to the surface of the cranberry water. And then on the downwind end of the bed they corral fruit and they use pumps to suck it into trucks.

[1:00:05]

MD: Oh, wow.

BS: It's a fascinating thing to see. And cranberry growers are incredible at reusing water. So people would think, well, it's a high water-demanding crop. But they have holding ponds and catch rainfall, obviously, and they recirculate their water. So when they're done flooding one bed it'll go into the next bed.

MD: Oh, okay.

BS: And they'll also use flooding for pest control. Flooding is a great method to drown-out any soil-born insects, and it's a really—and in Oregon it's also used to apply sand as a kind of an added cultural method to invigorate a bed. So it's a really cool crop to work with.

MD: And the plants don't mind being submerged.

BS: They don't mind as long as the water is agitated, it has oxygen in it, and then they're not flooded for too long. It works extremely well.

MD: And I understand our berries, cranberries here, are kind of prime berries—

BS: They are.

MD: They use them for color?

BS: For color. So that's true for all of our berry crops. They're considered to have very intense color, and mainly that's due to our relatively warm days, but not too hot; relatively warm summer days and cool nights. So we get this high color development of anthocyanins, promotes the red color, and at night we get very little respiration, so the plant doesn't respire as much. So we get sweeter fruit generally, more colorful fruit, and our fruit ripen more slowly because it's cooler. So we talk about this in pinot noir production too, where if you compare pinot noir grown in a warm region where the wine might be fine but it just maybe doesn't have all the character of a cool climate pinot noir. And that's because our growers can wait and wait and wait, especially if the autumn is dry, where they can let that fruit ripen. It ripens so slowly that the acids don't drop as fast as they do in a warmer climate.

So they have more control on when they harvest, and just in other berries too those characteristic aroma and flavor compounds come on at the end of the ripening period. So you can wait until they have that optimal ripeness. And all of our berries for processing and for fresh can be picked at the optimal level of ripeness. They have this incredible we're not forced to pick because it's really hot, and we're not forced to pick because oh, the acids are dropping, so shelf life, so how long it can be in the store or stored is declining. So our growers are just exceptionally good at picking at that best quality so that we just get this really high quality fruit that comes from this region. And that's really the niche that our growers have.

And our climate is one of the reasons why within the last, since 2006, we've developed an organic berry production research program that is, I think has been recognized as really the only one of its kind in the world, because we have the only certified organic berry research acreage, and it's at North Willamette.

MD: Oh, wow.

BS: And I started that because the industry asked me to, and I'm doing that in blackberries and in blueberries. And when I started that research in 2006, in blueberries, about two percent of our total blueberry acreage, probably in Washington also, but in Oregon, was organic. Now in both of our states it's over twenty percent is organic, since we've been doing

this research. And we have an incredible climate here with our low humidity in the summer, less disease, a lot less insect pressure than in many other regions, that makes this *the* place to grow organic blueberries.

And our growers, we've been developing production system recommendations; how to best fertilize, how to best manage weeds, and we've come a long way. And we've got some conventional growers that are adopting some of the techniques that we have learned for weed management, to help them reduce costs and improve yield. So that's exciting. That's a new, it's a new page.

MD: So we're the berry Eden of North America, yeah.

BS: Yeah.

MD: Well another berry—or not really a berry, but you were involved—this, I just love this—you were involved in developing a tiny kiwi fruit, argute?

[1:05:03]

BS: Argute, yes.

MD: Yeah, that's hardy and without fuzz and it can be grown here in this climate and you can eat them like grapes, skin and all.

BS: That's right.

MD: I mean, they sound wonderful.

BS: Right. Now to be fair I did not develop argute. But here's a classic example of where there's a berry that has potential for our region and it's just a matter of the right people being connected together. So we had, we put in a kiwi fruit evaluation planting at North Willamette, and I put this in in 1990, before I was berry research program leader there, and we were testing different species of kiwi to see if we could find something that was more adapted to our region than the fuzzy kiwi, Hayward. And Hayward can be grown here but in our cold winters you lose the entire aboveground plant; you have to start again from a new sucker that comes up. And California's growing Hayward well, so can we find something that's better adapted here that maybe they can't grow as well?

And so we put in this trial and argute rose to the top for having good flavor and good quality, and there was very little worldwide production of argute. I couldn't find much about it anywhere else. There were some other test plantings in New Zealand and in Italy; other big fuzzy kiwi producers. None in California, that I was aware of. So myself and Joe DeFrancesco were looking at these kiwi and we hooked some fruit from our trial up with Mark Hurst of Hurst's Berry Farm at the time, and now Hurst Berry, HBF International. And we said "you know, this is a lot like a berry." It's the same size, it technically is a berry, which is why I can claim working with it. And so it's more fragile than fuzzy kiwi; "is this something you might want to consider looking at?"

And so they did and they put in a planting and it sort of snowballed from there. I developed a kiwifruit. I had three graduate students learn more about argute, the baby kiwi, because we knew nothing about it so we had to learn about its physiology, how do we prune it? And so they did some more basic physiology questions on argute, particularly Ananasnaya, the main cultivar. Some of this was done at two grower collaborator sites. That got more growers interested in it. And now I would say it's probably a two million dollar industry. It's grown from nothing to a two million dollar industry, and we are a leading producer in the US for sure, for baby kiwi, or hardy kiwi. And we're starting to look at new varieties.

And here's what you hope happens, because that's, even at two million, it's a minor drop in the bucket to other berries here, so I can't devote a lot of my time. But what's so satisfying is that when you have a company—and Hurst's is still the main one; HBF International is the main company buying—but there are now independents and U-picks and organic farmers growing for farmer's markets. And the industry has been very open and that is true by pretty much every berry crop, is that it's to the benefit of the whole industry if everyone produces a quality product.

And one of the satisfying things about working here has been how open our growers have been. And to generalize, that is so true. And the number of growers who are willing to help new growers, and be open if I want to take somebody to their farm, far outweigh those who say "you know, I really want this to stay proprietary," or "I have an edge here and I'd like to stay that way." So I mean, obviously people are in business and keep some secrets, but they have been so good. And the kiwi industry is a good example of that, because now we have a lot of kiwifruit farmers. And while I provide some guidance, the grower liaison with HBF International provides quite a bit of guidance to new growers.

MD: I mean that's almost, you know, a community type thing, as opposed to—

BS: It is, absolutely, absolutely. So it's been exciting.

MD: I'm going to have to look for some.

BS: You do, they have a short shelf life. Harvest of these is probably going to start very soon here, and then many are, ironically, shipped back to Asia. And it's a native Asian crop, so that is one that leaves me scratching my head. I don't understand why we have to be growing a crop that's native to Asia. That's fascinating to me. But they're a very high-value, fresh-shipped fruit, and anything that won't make fresh is processed for nutraceutical health benefit product, because it's also a very healthy fruit.

[1:10:26]

So hopefully, I think we're at the point where we're getting more acreage where people are starting to see it. I saw some in Trader Joe's a while back that actually was from New Zealand in the offseason, because they can't be in a store six months like a fuzzy kiwi.

MD: Oh okay, yeah.

BS: So people should look for them. You know, sort of an extremely large grape size; it would be about double or triple the size of a grape, smooth-skinned, and pop the whole thing in your mouth.

MD: Oh, I can't wait. One of the berries that we haven't talked about and that is not part of your research, that I'm interested in basically because of my father-in-law, is the huckleberry. Are they possibly a berry that is commercial? Or do we have to go up into the Cascades for all our huckleberries?

BS: Ah, so you just defined it there; when you said you go up into the Cascades. Here's the problem with common names: so what is called a huckleberry in Oregon is not actually a true huckleberry. So the true huckleberry is a different genus than blueberries. What we call huckleberries are wild blueberries. So a true huckleberry is native to eastern North America and is a different genus: *Gaylussacia*. So it does produce a fruit that is blue and looks like a blueberry, but it has ten larger seeds in it, so if somebody really wanted to pick it apart they would notice it as ten larger seeds rather than the very small, as many as eighty to a hundred seeds that a blueberry might have. But a common name is huckleberry. We have lots of wild huckleberries, or native blueberries, in Oregon, many, many in the Northwest, all through. And many of them can be picked by hand and are really good and have been picked by our indigenous people for eons and were a really important staple in their diet and in pemmican and other products that they produced.

So some species of huckleberries are being used by Chad Finn in his breeding program to impart small size and that characteristic, more intense huckleberry flavor that can occur in some clones. But they don't grow well in the Willamette Valley. They have their microclimates that they're adapted to, and so I get that question a lot, you know, "can I grow these in my yard as a garden plant?" And there's one that you can, it's *Vaccinium ovatum*, which is called the evergreen huckleberry. It produces a tiny fruit. I don't know, some people have the patience to pick it and pick enough for a pie, but it's more of an ornamental with its beautiful red new growth, and it's used a lot, grown a lot as a hedge, and it'll grow in the shade or in the sun. But it's really not as much of a fruit crop as it is an ornamental or for the florist trade. But the other native huckleberries that you see in the wild, I enjoy them in the wild and I guard my spots, like most people do, where you find them, where there's a productive patch.

MD: Yeah.

BS: You know, "watch out for bears" and that kind of thing.

MD: Well, now your, like I said, we talked a little bit earlier about your list of publications, which is absolutely staggering. Now your research and writing process is probably different than a lot of disciplines, because it either takes a long time for these bushes to mature or you have a bunch of different projects going at the same time. Do you have a process?

BS: I can write pretty quickly, but I need to say the only way I can be this productive is to have such a good team. So the first part of that is students. A lot of my papers have graduate students as first authors, and many of my master students, while typically in Ag Sciences they're expected to get one refereed paper out of their thesis, most of mine have two and some have three. And so that's to their credit, and they have good projects. And that is, I think, an important part of the learning process. And of course PhD students would often have more than that. So that's a key part. I've had great students that have encouraged, and I hope I've encouraged them, to be productive.

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And that to me is a really important culmination of their graduate degree. And none of us are happy; they and me are hopefully not happy unless it culminates in that, hopefully before they leave, but if not, afterwards. So that's an important part. I've had some undergraduate students who have done thesis, honors thesis projects with me and have published, and that's been very satisfying for them, and something I remember fondly when I was an undergraduate student. And so I think if I can give them those same opportunities I had, that's important. So that's part of that.

And I have really good technical support. I have a Faculty Research Assistant, currently Pat Jones, who works in the cooperative breeding program with Chad and myself. And then I have Amanda Vance, who works with me on the production and physiology side. And you know, when you have really good help you can be more productive because you're working with them, and they're working with you, on analyzing the data and interpreting the data and helping collect the data and working with the summer students that we hire. And so to have the funding to be able to have a big program—so the support from OSU, the support from the USDA-ARS, the facilities that we have, the students who are interested and want to work with us. And then the industry support through funding, through grower trials, being able to do research on their fields. And then the federal and some state funding. If we don't have any of those pieces, you just can't be productive. You need the energy and the drive, but without all that help you just can't do it. And so I've been blessed that way, and I do not take it for granted. I know I have colleagues who could probably be equally productive at other institutions, but they just don't have the resources.

MD: Yeah. And so you're almost a shepherd—

BS: Yeah, probably in some ways. I would see, I mean when I retire—and I think that'll be a while still; I'm still relatively young, I was fortunate to have been able to start young—when I retire I hope that I'll be looked upon as being someone who did make a difference at all levels. You know, that I was a good boss, a good mentor, a great colleague, a good friend—I count my colleagues as much friends as colleagues—and that the students feel like I was able to help them be successful and that I made a difference to companies and industries and growers. You know, I do consulting too, so I added that to my full plate. And most of that is international where I can sort of satisfy that economic bent, which is they'll do it if it's economical. So helping them make more money through better quality or better yield is something that's a whole new challenge when it's in a totally different climate. So I find that's a new added challenge. And that sort of almost provides almost immediate gratification, you know?

MD: Yeah.

BS: They wouldn't ask me to come again if I wasn't helpful, right? So that's something I can see myself enjoying after retirement, but it's just so exciting. I just love what I'm doing.

MD: I love the passion. And people, industry as well as the institutions, have recognized you and your accomplishments. I see clear back into—I mean these are just some of the highlights that we were able to glean through some of your information that's online, but in '96 an award from the—there's a Briskey Award for Faculty Excellence, and that's within

the College of Agriculture. In 2003 we have a leader in—Outstanding Leader in the Blueberry Industry, and that's from the Growers' Association.

BS: Yeah, that meant a lot, yes.

MD: Yeah. And then 2005 we're looking at the Excellence in Extension Education, and that's with College of Ag and Extension. So we're hitting all these areas. And also in 2007 you were elected a fellow with the American Society for Horticultural Science, and that's part of this long-term relationship with your professional organization.

BS: Yeah, that's right. It's pretty much your peers who choose from the US, obviously, and it's the highest honor that our society can bestow on a horticulturalist, so that was really an honor. And I was joking with my family saying "boy, fellows are nice gentlemen in Canada," so I didn't think [laughs] I can call myself a fellow, it's a bit weird. But that was a big honor, to get that award.

[1:20:24]

MD: And then more recently in 2008 you were elected—well, recognized as one of the Extension with the Faculty Achievement Award through the Extension faculty.

BS: That's right.

MD: And that's kind of like a best teacher type thing, or?

BS: Well, I got the OSU Extension Educator Award, which was a big honor because that's OSU-wide. And then I think it was a couple of years ago I got the OSU Alumni Association Distinguished Professor Award, which was a huge honor. And then this year, through the American Society for Horticultural Science, I got one that means a lot to me, which was the Outstanding Graduate Educator Award for all the graduate students I've taught. And that one means a lot, because I believe quite a few graduate students have to write letters for those that are nominated. And so that means a lot, that they took the time to do that. And training graduate students is really an important part of what I do, so that meant a lot to me.

MD: Yeah, so that's kind of a, not a lifetime achievement award, but you know, it kind of validates your years of working with these people.

BS: Right.

MD: Have you ever counted how many graduate students have you influenced?

BS: I've sort of lost count; I'm somewhere between twenty and twenty-four—

MD: Oh wow, yeah.

BS: Really diverse group, from many countries, men, women, different nationalities. It's just been a wonderful experience.

MD: So one of the things I like to do is, a where are we today and where are we going type of thing. What are some of your real current projects in your—front of mind?

BS: Sure. My current projects are continuing to look at—so I have a pretty diverse palate still, because I want to work on as many of the berry crops as I can. So presently I'm focusing still quite a bit on plant nutrition so that I can help the growers optimize their plant fertilization programs. So the way I'm approaching that is from the plant-centric point of view, and so I'm working with colleagues and students to learn, how does the plant take up all these other nutrients? Not just nitrogen, but phosphorus, potassium, et cetera, calcium and all the micronutrients. Can we learn from looking how the plant grows over the season and when the plant needs these nutrients the most to help better time that fertilizer applications? How much is removed in the fruit and when we prune, to better figure out how much do they really need? And I'm doing that in pretty much all the berry crops.

So that's something that's ongoing, which the ultimate capstone goal, in addition to refereed papers, would be totally revising our cane berry and blueberry nutrient management guides, and developing a new strawberry nutrient management guide. We just finished a cranberry nutrient management guide, so that one's done. And I would like to develop a kiwi nutrient management guide, and then to basically give growers the toolbox they need. So a lot of that, one would think, would be for conventional growers, but I'm doing something similar through PhD graduate students and master students in blackberry and blueberry, in organic. So there aren't any research-based organic production guides for these crops, and so that is a culminating goal that I want. So I have a PhD student who's also surveying the organic blueberry industry here to find out more about what are their needs. And so I've really shifted quite a bit since 2006 to a decent effort in organic, but a lot of what I like to do is applicable to both organic and conventional.

And in addition to that I'm working on trying to find a way to increase the calcium content of berry fruit, because that's often related to storage quality. So that's something the industry is interested in. There are a tremendous number of products available; do these work and which ones work the best? If so, how can we help growers learn how those work? So that's an added piece that I'm doing. So I'm continuing to learn more about berry quality and those issues.

[1:25:14]

MD: Yeah, because one of the things that I found interesting was, when you're working with the other organizations to look at what's the next greatest thing. I mean what do we have to look forward to?

BS: Sure, I mean obviously I continue to work with Chad Finn, the berry breeder, and we continue to look for new potential fruit. So that never stops. The thing is, it's hard to know what that next thing's going to be, so we keep an open mind about that. But I think what hits us the most is trying to find out how can—I guess my question hasn't really changed from when I first started—is how can I help our growers be more successful? Because we can only—most of our berry growers, maybe a thousand family farms here in Oregon, just berries. And how can I help them be more successful so they don't lose the farm? I mean that's my goal. So that means a quality niche or producing higher yield or better economic returns; producing the same yield for less cost. So that's something that I've always included in that economics piece, and that's always been very important to me. And I don't see that changing. Maybe the way they approach the job might change, but I don't see—the way they approach getting there might change but I don't see that question changing. That continues to be a really important thing.

And there are always brush fires; spotted wing drosophila being one of them, and we have great entomologists working on that. And if there's a horticultural piece that can help manage that, and there are, then I'm involved in that. Continuing to work with growers on pruning, and optimizing pruning systems in blackberry and in blueberry has been very important. So I think one thing where we're moving toward in the future is more out of soil production, and that might influence Oregon also. We're seeing more and more raspberries, blackberries and blueberries being grown in containers worldwide. And while I see that in my consulting business, I don't see it here in Oregon, because we're blessed with really good soil. But what happens when there's more and more pressure on the soil that we have here? And we have Oregon companies that are farming in other regions. They're still Oregon companies but they're farming in other regions that may be less desirable, and they're doing that to keep the company more competitive; to have berries at a different time a year.

And so I'm co-advising a master's student who's actually looking at blueberry production in containers - what's the best substrate to use, how to best fertilize them, particularly with potassium. And so we try to have our research be on that cutting edge, maybe ahead of the curve for when a grower will need it, because we see more and more tunnel production, trying to improve our climate at the ends, both in the spring but particularly in the autumn when we get rain. Growing a late-fruited berry under a tunnel to protect from rain when the value of the fruit is very high is a desirable thing for our growers. They can make that economical. So we help them with that. So I could see that as being a change that's coming.

MD: Now one of the things that—well especially with our incredibly hot summer this year, have you seen global climate change affect the Northwest and your industry that you deal with? Is it something that we need to deal with? You know, twenty years down the road are we going to have problems?

BS: We need to deal with it now.

MD: Well, yeah.

BS: Yeah, it has affected a change. I mean, for several years in a row we've had particularly dry summers, and this drought has been, you know, it's a culmination of lower than average winters and rains, and so we have to get at that from a multipronged approach. And varieties that are more heat tolerant and more drought tolerant is certainly something that we need to do in terms of evaluating them in different climates, and that's a goal of the breeding program, I know. But in terms of production systems and plant physiology, I mean, we have students that are looking at deficit irrigation. We've looked at it in blackberry. In fact one of my students who's writing her thesis right now, Emily Dixon, she looked at, in organic blackberry, comparing plants that received irrigation after harvest, which for us is basically the end of July on until when it rains in fall, compared to those that got no irrigation for August and September, pretty much.

[1:30:27]

And we're doing this in collaboration with Dr. David Bryla at the ARS and Luis Valenzuela, who's a post-doctoral research associate who works with us. And what we've learned is that there's no difference in yield. There is no difference in yield, and this is with two years of yield data, three consecutive years of not irrigating in our hottest months. These blackberry plants are getting the water they need from deep down. And so Luis is looking at root growth, and they root pretty deep, and that's where they're getting this water. Now what does this mean? That means that this crop is more likely going to be less impacted by drought than some other crops, right? And it also means that in a year that there is drought, where can we save water? We can save 62,000 gallons of water an acre by not irrigating after harvest. And as a big bonus, we found that marion was more cold tolerant when we let the plants get tougher by not irrigating them.

So there's a potential and all of this ties together and it's, we all have to be looking at ways that we can save water use. You know, have plants more adapted to these hotter summers, and growers using more shade, finding ways to cool the plants, these are all things. I don't think this is going to be changing in the future, I just think we'll be doing more of it.

MD: Yeah, and it's all based around, the world is changing.

BS: Absolutely.

MD: You have to adapt.

BS: Absolutely.

MD: Well we also like to round out our stories of our subjects, by catching up with family life. Let's talk about what, does your husband do? I understand he's a plant guy—

BS: Yes, right.

MD: And children, that type of thing. You settled in Oregon, naturally.

BS: Yes. Well my husband was also educated in Canada and we did not meet in Canada, we met here in Oregon, so the irony of that. My husband, Neil Bell, also works for Oregon State University. He's a county Extension urban horticulturist, works in the Urban Horticulture program. His area of specialization is in drought tolerant plants. He has done evaluation of different genera that don't require summer irrigation at all, so that kind of fit in with what we were just talking about. And nurseries have adopted several of the selections that he's made in the different genera. So he pulls plants from all over the world to evaluate them. So that's kind of cool. And he works with the Home Horticulture program. So his specialty is ornamentals, so that's what interesting. It's more his background.

We—I said to you earlier than when I retire I want to feel like I've made a difference. And I think the most important thing, certainly in my life, is family. And one of the interesting things is that I've had administrators ask if I would be willing to mentor young female faculty who have just started, from the perspective of a female faculty member who's been able to do it all; who's been able to be a wife and a mother and still have a very successful career. And so when I start—that sort of got me thinking about it, because from my perspective it's always been no big deal. You know, if you're an Energizer bunny you can make family your number one priority. You need that balance to be able to work hard, I feel, anyway.

And when I retire and I'm done with that, I hope to goodness that my kids, my daughters, will be able to see that and feel like I was not just a good mother but was also a really good professional person. And I think I'm hearing from them that they have mentored me, they do want, they want to have a professional career, I'm getting the impression that—and things can change, but I'm getting the impression that they want to have a similar successful professional career and still have a family at the same time.

[1:35:23]

And so my daughters, Shannon, Shannon Bell, she's eighteen, she's starting her second year at the University of British Columbia. So she also started young, and she is interested in environmental science, and I couldn't be more proud. She's an exceptional student, she studied here at Crescent Valley High, was valedictorian, and she's doing exceptionally well at UBC. And she chose UBC because it was my husband's alma mater and she loves the campus.

MD: I do too.

BS: And it's just a beautiful campus and it's really well-known for environmental science. And I wouldn't be surprised if she ended up in academia in that sense. She's got my support and my husband's support to do what she wants to do, and I just wouldn't be surprised. I think she would be a good teacher, I think she will love research. And so I'm going to thoroughly enjoy seeing how she grows and develops. And then our youngest, Nicole, is sixteen, and I think she will end up in science also, but perhaps animal science. So we'll see. She has a real—she does a lot of volunteering at the Turtle Ridge Wildlife Rehab Center and she has a real gift with animals.

So it's really interesting seeing how, early on, I didn't think Shannon would end up in science. She is a national award-winning artist, she started thinking she would go into business and then it became science. So it's funny; she had a similar thing to me; maybe there's something other than science, because that's what both my parents are doing. So there you go. Yeah, so my husband and I are very proud of the girls and they're both very bright and I think they're going to be very successful. And if, you know, as a mother I couldn't be more happy, you know?

MD: Oh, yeah.

BS: And we live in Polk County; we built a home on five acres and we have our own huge landscaped garden and berry patch and vegetable garden, yeah.

MD: Your home experiments.

BS: Absolutely, yeah. It's wonderful to live out in the country.

MD: Yeah. What are your other activities? What, do you have hobbies?

BS: Absolutely.

MD: Do you have time for that, or?

BS: Well we do like to travel a lot with the girls. We like to give them the same opportunity, certainly, that I had, and we feel that—and they say it—it's enriched them quite a bit, and that's a good thing. So we've done quite a bit of that. And we all love to go hiking. We've hiked in many places, many countries and many places, so hiking would be probably our leading activity, hiking and camping. And then my husband and I both have a classic Mustang, so that would be our money pit and time pit, perhaps, for our extra time.

MD: What year?

BS: 1970 428 Cobra Jet Mach 1, which—and then a 1973 red Grande. I'm the second owner on that one. Both are restored to original, and when we have time we go to shows, but it's a time thing. And I think our youngest has inherited that bug, the Mustang bug, so we'll wait and see what her first car is perhaps. So yeah, lots of friends, lots of family. You have to have a really well-balanced and rich life to be able to withstand the stress that this type of job can have, and I couldn't have a more supportive family. My parents were incredibly supportive to get me where I am and my husband and kids

have been tremendously supportive. So I am so thankful for that. And I'm looking forward to lots more years and a happy retirement where I'll have more time to do some of these hobby things, especially.

MD: Yeah, and then take on the role of grandma.

BS: Oh gosh, I don't even want to think about that yet.

MD: Well one of the things that we always do is, we've talked a lot, but are there any things, any final thoughts that you really think that you need to share, either about your philosophies or Extension or your career that really we haven't touched on or reported that we need to?

BS: Right. Well we have covered a lot. I think, to circle back, the reason I took this job was because there was a lot of support for Extension, research and teaching at this land grant institution. And I know that it's tempting to not refill positions like mine that may have a greater challenge to big federal grants that often drive these big university programs, but I think I've proved that it can be done if you have a good team of people, and that includes my colleagues, obviously, as part of that team.

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And we're successful because we have those three strong programs where the lines are fuzzy. I mean to—you know, the percentages of my job mean nothing. And I've never heard Extension, Ag Experiment Station or the teaching administrators who work with me, who are my bosses, say "Bernadine, you're not working within these percentage lines, that 55, 35, 10." That's a good thing, because they realize it's a true blend. But administrators can change and university priorities can change, and so I guess my big hope is that when I retire they'll refill this position. I mean, I think it's kind of unusual that while I'm still here we've developed, through the OSU Foundation, an endowed berry crops professorship with a goal of raising at least a million. We're about a third of the way there, which is wonderful, but the goal is to get there so that we can refill this, because it's going to be very stressful to hire a new person who has a three-way split. And yet, if they don't, then who's going to do the teaching? Who's going to do the Extension and who's going to do the research? So that's my hope, is that there's enough of an endowment, enough industry support, which I'm confident that there is, that they can hire a really good person to kind of take up where I left off. So just that would be the most satisfying thing, I think.

MD: Big shoes to fill.

BS: Yeah, well I don't think so. I have small feet [laughs].

MD: Well Bernadine, on behalf of the OSU Sesquicentennial Oral History Project, we truly appreciate your participation, and I've learned more about the berries and things that I love to eat than I ever thought I would.

BS: Oh, that's great.

MD: And now everybody in the Beaver Nation will know too.

BS: Oh, thank you, and go Beavers; I'll always be a great supporter of OSU. It's just a fabulous place. So thank you very much.

MD: Thank you.

[1:43:03]