Free the Seed!
Transcript for S1E3: Hyper Red Rumple Waved Lettuce

Rachel Hultengren: Welcome to Free the Seed! I'm your host, Rachel Hultengren. This podcast is for anyone interested in the plants we eat – farmers, gardeners and food curious folks – who want to dig deeper into where their food comes from. It's about how new crop varieties make it into your seed catalogues and onto your tables.

In each episode, we hear the story of a variety that has been pledged as open-source from the plant breeder that developed it.

We'll be talking today with Frank Morton of Shoulder to Shoulder Farm about his lettuce variety, 'Hyper Red Rumple Waved', and about his journey in breeding lettuce, from salad to seed. Frank and his wife Karen are the originators of Wild Garden Seed, a farm-based organic seed company based in the Pacific Northwest, and Frank has pledged as open-source not only 'Hyper Red Rumple Waved', but all of the varieties and breeding populations that he has developed.

Rachel Hultengren: Hi Frank, welcome to the show.

Frank Morton: Hi Rachel, thanks for inviting me. I'm glad you're doing these podcasts.

Rachel Hultengren: Yeah, thanks for being with us today. So maybe you could describe 'Hyper Red Rumple Waved' for us?

Frank Morton: Okay. Well, it's an upright leaf lettuce. It's sort of a romaine shape, but it doesn't form a dense heart. It's very dark red, the leaves are puckered and savoyed. The margins of the leaves are wavy, that is the edge of the leaf is not smooth, but it's sort of ruffled. It has good downy mildew resistance. I've gotten a lot of reports about its cold hardiness, and it's a lettuce that, I don't know, I think we introduced it about twenty years ago. So I've had to sort of refresh my memory about just it a little bit; it's a lot of lettuces back there.

Rachel Hultengren: So it sounds like it's been a while since it was released, but remembering back, how did you decide to take on this project of developing a new variety?

Frank Morton: Well, you sort of have to get back to where I was in terms of my farming life at the time. During that period of time, Karen and I were salad green growers, and we grew salads sort of on subscription for restaurants. It was sort of like a CSA, which is to say a restaurant was signed up for a certain amount of salad each week. And we would ship salad from our farm using UPS trucks and Fed Ex and the USPS and we would ship salad to… well we're in Oregon here, but we would ship salad to Seattle, to Portland, Boston, Washington DC, Philadelphia, NYC…

Rachel Hultengren: That's quite a reach!

Frank Morton: It was quite a reach. We did that for about 18 years or so. And during that period of time, I was learning about plant breeding as I was doing this salad thing. I'm really an accidental plant breeder. Lettuce sort of showed me what plant breeding was about. I saw my first off-type lettuce in a seed flat in 1983.

Rachel Hultengren: What does that mean, for a seedling to be 'off-type'?

Frank Morton: Well, I had started saving seed for myself as soon as I started farming. And I had saved some seeds in 1982 from a variety called Green Salad Bowl**.** And one day in 1983, I saw one red plant in the middle of all these green plants. And I had planted thousands of these seeds at this point. And here in this flat among 200 green plants was one red plant. And I thought about it, and right away I understood that that had to have been an outcross to a red romaine that I was growing at the same time for seed. Looking at it, it looked like a red salad bowl. It had oak-shaped leaves, and I was thinking to myself right away, "Well, if I save seeds of that plant, I could have myself a red salad bowl", which in my experience would be a brand new thing. And I thought that would be a neat thing to do, so I let that off-type plant…

See, off-type plants are plants that are not the same as all their siblings. They are… off! And the normal advice, when you see an off-type in your lettuce flat, is you throw that thing away. Because it's not what you mean to be growing. It's a contaminant in some sense. But I immediately recognized that, "No, this is an opportunity. This isn't something to throw away, this is something to save." And that sort of defines my career, actually, finding things like that.

But I saved seeds from it, so the next year I plant these 65 seeds. And yeah, there were some red salad bowl types in there, but what I really saw was the whole genetic spectrum. In plant breeding terms, this is the F2 generation. The cross would be the F1 plant in breeder parlance.

Rachel Hultengren: So two generations from the cross.

Frank Morton: That's right. So the second generation shows you the genetic recombinations of all the original parents' traits. There were green oakleafs, there were red oakleafs, there were green romaines, there were red romaines. Every possible combination of traits that you could think of in the original ' [Green] Salad Bowl' by 'Red Winter Cos'. All those traits were redistributed among these 65 plants.

And that's when the light bulb really came on. It was like, "Oh, this is where new varieties come from! I see!" So truly this was a case of the plant showing me something, that if I'd really thought about it hard, I would have remembered all my high school biology and my college horticulture classes, and I would have had a much fuller understanding of what was going on, but I just wasn't prepared to think of it that way until it was splashed out in front of me. That's why I call myself an accidental plant breeder. I didn't intend to become a plant breeder. I just saw this opportunity and I realized that plant breeding could be a tool for my farming business. Plant breeding could be a method for me as a farmer to have new stuff that nobody else had. And since my customers were chefs at fine restaurants, that's what all chefs want – they all want something new that other people don't have.

And so, I realized that what I needed to do was grow all of these plants out to seeds and save the seeds of each one and then keep planting them out. I was basically figuring this out as I went along. So I did that, and within three years, I had these distinct lettuce varieties that I could put a name on. And one of

the varieties that came out of that was something I called 'Wavy Red Cos'. And that was one that I stabilized, and I started using in my salad business right away.

Rachel Hultengren: When you say that you stabilized that Wavy Red Cos, what does that mean?

Frank Morton: Well, when you cross two unlike plants, like a green oak-leaf and a red romaine, it is as if you have shuffled the deck on their traits. And in the next generation, each plant that comes out of that is sort of like a new hand of cards that's been dealt out of that shuffled deck of genes. At least that's the way I thought of it at the time. And what happens is that with each generation, those genes sort themselves out again. Each generation, the amount of variation within each line is decreased, so that if you keep selecting something that, let's call 'Wavy Red Cos', if I select for that in the second generation, and then I grow all those seeds out and select for it again in the third generation, and then I grow those seeds out, in the fourth generation they're all going to sort of look like Wavy Red Cos, with some outliers.

With each selection that you do, assuming that you're selecting for the same thing each time, you develop a genetic heritage that becomes more and more stable and uniform with each passing generation. And so it takes about eight steps to get close to 100% uniformity.

And so from any one cross, like that one that accidentally happened for me, each one of those F2 plants could be bred out to become a different thing. I mean, I could have had 65 different varieties from that first cross. Some of the varieties would look quite similar, some would look very different, but each one would be its own genetic entity, even if they did bear similarities to their siblings.

Rachel Hultengren: How many varieties did come out of that initial accidental cross?

Frank Morton: That's a good question. I'd say there were at least 8 varieties that I ended up stabilizing out of that. And most of them don't exist anymore; they were sort of stepping stones to the next step.

In some sense, this was step one of my plant breeding with these lettuces, because now, because I had these, say, eight stable lines that I took from this, now I could cross those with other lettuces, like commercial varieties, and that would produce things that nobody had ever seen before, and they would be totally my own thing**.** By crossing commercial varieties with my own, original genepool, it assured me that I was going to have unique looking lettuces. So that's one of the cool things about it.

And so one of the varieties that came out of this I called 'Wavy Red Cos', and the original 'Red Winter Cos' parent was very smooth; the heads look almost like bullets. There're no waves, there's no sa voy in a 'Red Winter Cos' at all. But by crossing it with 'Green Salad Bowl', I created romaines that had a lot of savoy, sort of blister-leaf kind of texture to it, which at the time seemed pretty unique to me.

The cross that led to 'Hyper Red Rumple Waved' was 'Wavy Red Cos' crossed to 'Valeria'. 'Valeria' was something new in the US at the time. They were Lollo Rosso type lettuces that have the extremely ruffled margins on them. One of the virtues of this Lollo Rosso variety was it had very broad leaves, the leaves had extremely ruffled edges on them, and it was a really dark red. It was a darker red than my 'Wavy Red Cos'.

And being a salad guy in the 1990's, I wanted as much red as I could get. And if you could go back and look at seed catalogues from the 1980's and the 1990's, what you would notice is that none of the lettuce is really red, like we have today. Today we have lettuces that are so red they're black.

In the 1990's, you didn't see that. I remember when I started growing in 1980, the reddest leaf lettuce you could find was a 'Prize Head' lettuce, which was just pink on the top. There were no truly deep red leaf lettuces in 1978.

Rachel Hultengren: What changed?

Frank Morton: A lot has changed since 1978, or 1980. What changed was that the salad industry exploded. And what chefs always wanted was 'More color!', in the salad, as though green wasn't a color. No one was satisfied with how red lettuce could be, and it was a breeding goal of mine, probably starting at the beginning to make ever redder lettuces.

And so this 'Valeria' that I crossed my 'Wavy Red Cos' to was a darker shade of red. And when I made the cross I was seeing all different shades of red in that. And the way that I selected it - and this is how my business worked – my salad business was really a seed breeding business where I was selling all the rejects to restaurants as salad to pay for the plant breeding. That's really how it worked.

So I would make a cross, I would plant that seed out in a flat, I would see all the different shades of color in that flat, and I would transplant those plants into a bed to grow out for salad. But I did it in a way where I would start with the darkest red and I would lay them out sort of in color order on the bed. So as I harvested them, I could study each plant as it grew, so all the darkest reds would be in the same area and I could carefully compare how dark they were. And the way that we harvested this for salad mix was by picking the leaves that were 3-6 inches long. And we would come back to that bed maybe twice a week to pick leaves off it, and the lettuce might be there 6 or 8 weeks getting their leaves picked off once or twice a week until they started to bolt, by which point I would have selected which lettuces best suited me.

And I would mark these by literally picking a stick up off the pathway and putting it on the north side of the lettuce. And that was the only marker it had.

Rachel Hultengren: Pretty low tech.

Frank Morton: Very low tech. And nobody dare touch those sticks. I didn't like people to help me weed because they would always move the sticks. So that's how I did it, actually.

And it was selection under commercial production, you might say. As a salad grower, what I was looking for was the densest leaf. The denser a 4" long leaf was, the more that's the one I wanted.

Rachel Hultengren: Because it was heavier?

Frank Morton: Yeah, heavier.

Rachel Hultengren: And you got paid by the pound?

Frank Morton: Yeah. If you got a four-inch leaf that weighed an ounce, that was worth a dollar! Or something like that. I don't know - I figured it out…

So, yeah – I was trying to improve my salad through plant breeding, and it was very direct.

So what would happen is, at the end of the life cycle of this planting of plants, I would have a bed that would have a number of sticks on it, beside the best plants. And at that point I would clear the bed off, pull up everything that wasn't what I wanted, and the bed would be left with a number of individual

plants growing on it, and those would be grown out to seed, and I'd save the seed from each individual, and the next year I would plant them out again. And by doing that, I eventually came up with the darkest red, most savoyed, longest lasting, most downy mildew-resistant, waviest along the margined, heaviest by the leaf plant. And eventually one of those was called Hyper Red Rumpled Waved. And that's how it happened.

You know, I didn't know a lot about plant breeding at this time. In fact, I knew virtually nothing. I didn't really even understand the significance, from a breeder's standpoint, of self-pollinated versus cross-pollinated plants. I did not, at this point, even realize how lucky I was that I had chosen lettuce as something to concentrate on. Lettuce is self-pollinating, and the significance of that is that I could grow lots of varieties in the same garden space without them cross pollinating. They cross pollinate about five percent if you have them side by side.

If I wanted to make crosses, I could do it. And it was just a matter of growing two plants side by side and pushing their heads together when they're flowering. And then after about two weeks, you pull those heads apart before they have ripe seeds on them, and you collect seeds from each head, and you will find five to ten percent outcrosses on those lettuce heads. And the crossing has been done by little insects called thrips, mostly, I believe.

Thrips crawling from one flowerhead to the next and taking a little pollen with them and getting down inside the pollen tubes of those lettuces and spreading some pollen to them before they can pollinate themselves. That's basically how it happens.

So you eventually have to take that seed head and grow those plants out and identify which of those plants were crosses and which ones are self pollinations of the mother plant.

And you can do it in a flat. And this is how I do it to this day. I have my seeds in an envelope from the previous year. I plant a flat, and when they germinate, I look at the cotelydons, first off. And if it's a cross of a red and a green lettuce, you'll see that in the cotelydons of the green plants.

Rachel Hultengren: And the cotelydons are just the first little leaves that come out.

Frank Morton: The seed leaves, yes. Once you're experienced, and you know, a lot of this you have to experience, you have to see it in action to fully understand how easy it is. But once you have looked at enough seedlings, and enough lettuce cotelydons, and you have seen what they grow into, you begin to realize that the cotelydons will tell you whether a green lettuce was crossed by a red one.

Rachel Hultengren: This works if you've saved seed from a green-headed lettuce; then you're able to see the red outcrosses on the cotelydons.

Frank Morton: That's right. And if you do it the other way around, say you've got a red lettuce and you've crossed it to a green one but you want to use the red lettuce as the mother plant, the color red in the cotelydons will be less because it's been crossed to green. It'll be half as red, basically. So you can see that in the seed flat before any true leaves appear.

Rachel Hultengren: So it sounds like you've spent a lot of time looking very closely at little lettuce leaves.

Frank Morton: Yes, I have. All plant breeders have to look very closely at the plants that they're working on. My friend John Navazio likes to say you have to become a 'samari of the species'. That is to say, if you're going to breed the best cabbage, you need to have grown a bunch of cabbage before. And you need to really know cabbage, you know.

But you know, to your point, yes, you really have to look at stuff really hard. And that's how I did it.

I did it in the garden. None of this was done in a lab, none of it was done with forceps. It was done in a garden, under commercial circumstances in all kinds of weather. By doing it outdoors, as we say, in the "environment of intended use', I was able to do all these things without ever having a white lab coat or anything like that. This is not, what I'm trying to say is, this is not really a technological enterprise. It really is experiential**.**

So the process of making HRRW was one where I crossed my 'Wavy Red Cos', which was a nice 1980's red, I crossed it to a to a 1990's red, the 'Valeria'. And out of that came reds that were darker even than either of those parents. This is something that happens w.hen you do crosses. When you cross two things that are unlike each other, a large number of the plants are in the 'muddy middle' – that's what I call it. The muddy middle is where they're all kind of red, but they're not really distinctively different from one another. But then there are always the outliers: something that will be a very light red on one end of the bell curve, and something that'll be an even darker red on the other end of the bell curve. And of course what I was looking for was the darker reds.

So by crossing two things that were red for their time, essentially I made something that was redder than what was commonly on the market.

The next step, though – now, you see, this is all kind of a building thing. My first generations that came from that first original cross, they were cool to me, but they weren't really where I wanted them to go yet. And it took, well, as my wife and I like to say, overnight success takes about 15 years. So about 15 years after I saw my first cross, I was releasing 'Hyper Red Rumple Waved'. And it was what I was looking for in a salad lettuce, in terms of its intense pigmentation. So that was one trait I wanted; the other trait, though, was something really important to salad, and that is loft.

The leaves, the individual leaves, because of their savoy leaf texture and the wavy margins along the edge of the leaves, that creates a fluffy effect on the salad plate. It also makes a lot of nice dimples on the salad leaf that collect salad dressing. And the overall effect is that when you put your fork a 'Hyper Red', as opposed to something that's flatter, well as opposed to the 'Red Winter Cos' which was the granddaddy of all that business, the 'Red Winter Cos' is really flat. Your fork almost doesn't go through it because it's so flat on the plate. With a 'Hyper Red', when you put your fork in it, it is so savoyed and stiff and thick that your fork goes through it. There's really something there, and when you chew it you feel like you're just eating more leaf per bite**.** So my goal in doing this was a better salad leaf.

That's what I was out for, and the components of that are the color, the flavor, the texture, the shape. So that's why I'm saying that this kind of plant breeding I'm talking about doing is not technological, it's experiential. You know, what's my experience of eating this lettuce? Do I like it? Is it better than what I started with? All these things, they affect the salad eating experience.

Rachel Hultengren: So your experience as a salad eater and as a farmer, those two things came together really well as a plant breeder of lettuce. You were drawing on your experiences eating lettuce and your

experiences being out in the field, seeing how things were performing there to be able to do the selections.

Frank Morton: Exactly. And it was not based on anything I learned in college, or a list of traits that I memorized somewhere that are important traits. It had nothing to do with that. I was completely ignorant of all these things at the time.

I started doing this in 1984; it seems like every ten years I'm going through a different phase of developing these things. But it all is dependent on using the best of what came before. That's the overriding principle. And using the best of what came before in terms of plant breeding is essential; that's what plant breeding is all about. That's what it's always been about.

And this is why intellectual property restrictions on the use of plant varieties for further plant breeding is a very, very bad idea. Sociologically speaking, it's a terrible idea to encumber plants with patents that prevent them from being used for further plant breeding.

And that's why I became involved in the Open Source Seed Initiative.

Rachel Hultengren: You've been involved since its inception, right?

Frank Morton: Yeah, in fact before I ever knew that people in Wisconsin were thinking about this, I had also - was thinking about it. One of my sons was a little computer genius. When he was ten years old he was part of a Linux community.

Linux, of course, is all based on open-source software. And when I heard about Linux, my immediate thought was, "That's what we need for plant breeding!" Because at this time, this was around the year 2000, by that time, almost every new lettuce had a PVP on it, a Plant Variety Protection on it. PVP does not prevent you from using those varieties from further breeding.

But around the year 2000, we started seeing the very first plant patents coming out because of the Supreme Court decision saying that you could patent plants. And it did not take very long, by year 2006, there were utility patented lettuces that were in catalogues that were serving organic farmers. And when I saw that, I'd already been thinking about this for about six years, and when I saw the patents coming in on lettuce, it was like, "Okay, it's getting personal now."

The point being – it's only by finding the best plants - with the best disease resistance, and the best flavor qualities and keeping qualities and nutritional qualities – it's only by identifying those and then using them as parents for the next generation that we keep this moving ahead.

I mean, now people are putting patents on the color red! There are actually patents on red lettuces in which they claim that the red that they are patenting is a unique red that has a unique purpose and has never been seen before. And when I see that, I say, "Bullcrap!" That is not true! All these things have been seen before someplace. And in any case, you cannot patent something that is obvious to a practitioner in the arts of that thing.

Rachel Hultengren: And red lettuce was pretty obvious to you, right?

Frank Morton: It's pretty obvious that you can keep making lettuces that are redder and redder. That is not a stretch – that is totally obvious. So when European seed companies started putting patents on the

color red, I just knew it was all over. If they were allowing that, they were going to allow them to patent anything. Because there's nothing about that that isn't obvious.

Rachel Hultengren: Have those patents affected you?

Frank Morton: Well, sure. Yeah, because there are lettuces I dare not touch. I'll just call one of them out – it's 'Salanova', which was probably the first patented lettuce that made it to the United States. It had been patented in Europe before it got here.

And 'Salanova' – I'll tell you the honest truth, I've never grown it. I've seen it grown by a lot of people, I've seen pictures of it, but I've never grown it even though it contains highly desirable traits that I would like to access as a plant breeder. I just simply can't do it. Because if I were to involve 'Salanova' in a breeding program, and came out with a variety that had 'Salanova' genes in it, the owner of that would sue me, and would prevent me from selling the product of my work, and I would have wasted all that time.

With these patented lettuces that are all over the catalogues now, essentially they're all dead-ends, as far as I'm concerned. The only people who can work with them are the people that have the patents. And so, what are they going to do with it? They're not going to do anything with it – they're just going to sit on it and keep doing the same thing until their patent runs out, at which point maybe someone will pick up on that material and will be able to keep moving things ahead. But for the 20 years that these varieties are under patent protection, we can't access their, you know… they have superior disease resistance, that's a really important trait for organic growers, and it's off limits to us.

Genetics are… plant genetics as we know them are the collective experience of mankind. The orange carrot did not always exist – someone did that for us. And if it had happened that the orange carrot had been developed today by one company and that company put a patent on that orange carrot trait, that would deny the whole world access to the vitamins that come from an orange carrot. That's just not right.

Scientists, breeders, me – I've never invented a trait. The plants invent the traits. It doesn't have anything to do with the breeder. The plant makes the trait – it's something that's in the plant. And all we do is find it – it's a process of discovery. It's like noticing that there are moons around Jupiter. That doesn't make the moons ours. It's a discovery, it's not an invention. All plant traits are discoveries, in my view, not inventions. Varieties are inventions.

Rachel Hultengren: I guess we should maybe make a distinction here, which is that most of the utility patents are being applied for, or have been granted – what you're saying is that they are naturally occurring traits, that the plants produce the traits themselves and that those weren't things that any human thought up on their own and then made the plant do. There are utility patents in corn and soybean and cotton and other plants that are genetically engineered traits, like the Roundup Ready trait and the Bt trait, which were traits that were thought up by the companies that then did the work to genetically engineer those crops, and there was not a naturally occurring trait that those plant breeders went to get that.

Frank Morton: And I don't have a problem with that, actually. I'll grant you, synthetic biology and genetic engineered biology, that's something that people did. That's something that a scientist engineered. I agree with that. Naturally occurring traits in plants, however, are not like that. If all they

wanted to do was put utility patents on genetically engineered traits, that wouldn't bother me one bit. I understand that; I get it. A lot of technology and research there. But if they want to put… if they want to try to patent a bean because it's a certain shade of yellow, that's just wrong. The people didn't create that shade of yellow. And there's undoubtedly other beans in the world that are that shade of yellow, or there certainly could be.

Rachel Hultengren: So I have just a couple of questions that I wanted to get in before we finish up. One is – I don't expect that many people have actually seen a lettuce plant flowering, even folks who have grown lettuce in their gardens before, so I was wondering if you could describe for us what lettuce looks like when it starts to flower?

Frank Morton: Lettuce is an annual, so it completes its lifecycle in one year. So you plant the lettuce, it grows for as maybe as much as two months or so, producing its leafy head. And then it begins to what we call 'bolt'. And to 'bolt' means to put up its flowering stems that branch, and in that case, something that started out as a single lettuce plant will grow up to be five feet tall and three feet across. They get to be really big.

And at the ends of the branches, there are these flowering heads. So the flowers on the lettuce are small, yellow flowers, about a half inch across. They're composites, which means that what we think of as a flower is actually a collection of about 16 or 20 flowers that make up the yellow flower that you see. And in lettuce, the female part of the flower rises up through a tube that has pollen on it, whereas with many plants, the pollen will be on these anthers in one part of the flower, and then the stigma which is the female part of the flower will be quite separate from where the pollen is. And in those cases, those are mostly cross-pollinating plants. They are inviting a bee to come in and collect pollen and at the same time bump its head on the female part of the plant and thereby do a cross-pollination. In lettuce, conversely, the stigma passes right up through this tube and it collects its own pollen as it emerges. So by the time the flower is open, most of the seed there has pollinated itself. And each lettuce flower lasts just one day, and all the pollination that's going to happen happens by about noon that day. Then the petals fall away, and eventually you'll see the seeds that are developing inside this little cup. And there will generally be between 12 and 20 seeds per cup. A single lettuce plant generally makes about an ounce of lettuce. There are about 25,000 seeds in an ounce of lettuce, something like that. So each plant produces about 25,000 seeds.

Rachel Hultengren: That's a lot of seed.

Frank Morton: Seed is the best deal in nature, that's what I like to say. Especially things like lettuce. Anyway, in the end, that lettuce seed head puts out a cottony fibers coming off the end of the seed. Looks just like dandelion seed– everyone's familiar with what dandelion looks like. And so, on a lettuce, it's like a whole bunch of miniature dandelions. And in wild lettuce, when the wind blows, those little parachutes on top pick the seeds up and carry them away. In domesticated lettuce, usually the white fluff breaks off of the seed and blows away, but the seed stays on the plant. That's one of the hallmarks of domestication, actually.

And in sort of a funny story, I once crossed some domestic lettuce to wild lettuce because I thought I might get some interesting disease resistance and what not. And I produced a variety out of that experiment – I thought I was going to sell 50 pounds of it to the old Seeds of Change. And I grew a bunch of it, only to realize that in an open field, all that lettuce seed would blow away because the seed was

still firmly attached to the little parachute. And I had not sufficiently domesticated my variety. And we couldn't collect it.

So anyway, that's one of the things we have done, is actually change the physical nature of plants in order to make them harvestable for seed. In fact, I think it's considered the most important step in domestication is to produce a plant that does not shatter.

Rachel Hultengren: Does not lose its seeds before you can harvest them.

Frank Morton: Right, doesn't lose its seed before it can be harvested. And certainly in wheat, it was the non-shattering trait that made wheat something that could be commercially harvested a long, long, long time ago. So anyway, in lettuce, you can see that trait very clearly in wild versus domesticated lettuce, and it's a good thing that nobody patented that, as an example!

Rachel Hultengren: Yeah, that's a great example! Thanks for joining me today, Frank; I've really enjoyed our conversation.

Frank Morton: Thank you for very much, Rachel, for inviting me to do this. I'm honored to do it. Thank you.

Rachel Hultengren: We've been speaking today with Frank Morton of Shoulder to Shoulder Farm and Wild Garden Seeds about 'Hyper Red Rumple Waved'. Seed of that variety as well as many others can be found online at wildgardenseed.com.

Be sure to check out our show-notes with photos of flowering lettuces on the Open Source Seed Initiative's website at www.osseeds.org. Let us know what you thought of the episode by tweeting @OSSeeds. You can find us and like the Open Source Seed Initiative on Facebook to join an online community of folks interested in the future of intellectual property in plants. If you'd like, you can give us a review on iTunes, which will help other potential listeners find us there. Our theme music is by Lee Rosevere.

Thanks for listening! Until next time, I'm your host, Rachel Hultengren and this has been Free the Seed!