



FARMER TO FARMER

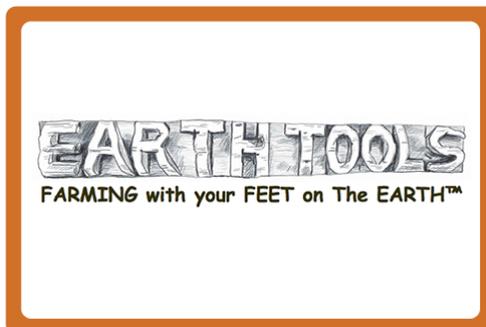
podcast



EPISODE 109

Andrew Mefferd of One Drop Farm and Growing for Market on Protected Culture and Plant Husbandry in the High Tunnel and Greenhouse
March 9, 2017

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Chris Blanchard: It's the Farmer to Farmer Podcast, episode 109. This is your host, Chris Blanchard. Andrew Mefferd farms at One Drop Farm in Cornville, Maine, with his wife, Anne, where they sell produce and transplants at farmers market to a Multiple Farm CSA and to local restaurants and food stores. Andrew is also the editor and publisher of Growing for Market Magazine having taken over that business from Lynn Byczynski last year. The magazine's 25th year in publication. Andrew's also the author of the just published Greenhouse and Hoophouse Grower's Handbook, a fantastic new guide to growing things under protected culture. This is a really cool book, short on the rah-rah and long on the real how-to, and Andrew really lets his nerd flag fly in the book and in our conversation today. Much of our conversation focuses on the lesson that Andrew took from his experience working at large-scale greenhouse growers as the tomato trial's guy at Johnny's Selected Seeds, and how he applied those lessons to his own high tunnel operation.

We talked extensively about how to take on some advanced greenhouse growing techniques without getting too deep into the weeds. Andrew digs into his opinions about the return on investment for increased management in the greenhouse, and he provides something practical tips for extending spring production in the high tunnel as well as for growing transplants for protected culture.

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tutorials available online at Farmcommons.org. Andrew Mefferd, welcome to the Farmer to Farmer Podcast.

- Andrew Mefferd: Thanks so much, Chris. It's a pleasure to be on the show. I'm a big fan and happy anniversary to you. I know this must be an anniversary of sorts, but I think you started two years ago in February of 2015, and I know you just had your 100th show so congratulations. I'm glad to be a part of the beginning of year number three of the Farmer to Farmer Podcast.
- Chris Blanchard: Thanks so much, Andrew, and of course, part of the show in more than one way because you guys have been sponsors in the past, and you're currently sponsoring the show and helping us get our transcripts out. We really appreciate that, thank you.
- Andrew Mefferd: Yeah, actually, I was looking at your website, and the transcript are such a nice feature to do your little offline. I'm so glad that we could help with that transcript sponsorship and help with that feature for your show.
- Chris Blanchard: Thanks so much. We're going to come back and talking about Growing for Market magazine a little bit more, but I want to start by having you situate us with your farm, One Drop Farm, there in Cornville, Maine.
- Andrew Mefferd: Yeah, so we have this farm here in Central Maine, and we have been certified organic since we started up here in early 2009, but before that, we started the farm in Central Pennsylvania, and we thought that's where we were going to be. The land that we were farming on was sold and so what we did is we started apprenticing again. I should say apprenticing because the way that we learned how to farm is by working on other people's farms.
- My family's farm in Central Pennsylvania was one of my entry points into farming. It's one of the things that got me interested. The first time I worked on a farm for a season full-time was on a farm that was just around the corner, so to speak, from my family's farm in South Central Pennsylvania. I worked a season on this farm and I liked it and so we took off cross-country and worked a season on a farm in California, and then we worked up in Washington State and came back east, and I worked for a season on the research farm for Virginia Tech in Blacksburg, Virginia. It was after that that we did start our farm in Pennsylvania for the first time under the same name, One Drop Farm. We had to go on hiatus from that, and what we did is we started working for other people for two more years because once we had started our own farm, we realized that there were few things that we wish we'd learned first time around and so we just went right back to apprenticing.
- We got a job on a farm in upstate New York, and then we got a job on a farm on the coast of Maine. That's what brought us to Maine. While we were working on the farm in Maine, we realized we weren't going to make it back to Pennsylvania, and we really wanted to get back to farming for ourselves. It was while we were working on the coast of Maine that we saw this farm here



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in Central Maine that we felt would be pretty perfect for what we were wanting to do, and we were lucky enough to move here at the end of 2008. We've been here ever since then.

Chris Blanchard: How many acres are you guys farming there?

Andrew Mefferd: Our operation has changed quite a bit over the years. Up until a few years ago, we have about 5,000 square feet under greenhouses and hoopouses, and then we have about two acres of field that we had plowed out and cultivated for vegetable production in the field. In fact, most of the years that we've been here in Central Maine, we sold at our local farmers market which is the Skowhegan farmers market, and we sold to a variety of what I call the local wholesalers. Natural food stores and some multi-farm CSA and some other local wholesaling opportunities and so we were doing certified organic produce.

When I left Johnny's, in fact, my last day at Johnny's was Friday the 13th of November of 2015, because I knew I was going to be taking over as editor for Growing for Market magazine and so I talked with Annie, my wife, and said that I had no idea how much time I'd be able to go out to the farm going into this new responsibility. I said ... She had really been managing the farm anyway since I had been working off the farm full-time for Johnny Selected Seeds for the previous seven years, so the whole time that we've been here in Maine, and so she wisely, I believe, decided to switch our business mostly over to seedlings.

That's an interesting story, too, because there's a woman named, Amy Leblanc, who is colloquially known around here as the Maine Tomato Lady. You may know this. There's also a Maine Potato Lady who sells potato seedlings and so Amy Leblanc of White Hill Farm, she was known as the Maine Tomato Lady because she had this amazing catalog of seedlings. She's the place where you would go to get all the heirlooms and the unusual varieties, and she had varieties she had collected herself from Italy and other countries over the years and so she was getting to the point where she wanted to cut back. She's still doing seedlings herself, but she just wanted to serve her local community. It was really interesting timing because around the same time that I got offered the opportunity to take over Growing for Market, we got offered the opportunity to take over her seedling business.

Seedlings are already something that we did a lot of just because that they're great for the early season cash flow, and we do live in a very rural area. A lot of people may not come buy vegetables from us at the farmers market, so we figured, hey, at least we can sell them the plants. So what we did was go from mostly growing vegetables with some seedling business at the beginning of the year to running the farm as a seasonal nursery. Now we do a lot more seedlings. I don't even know what, how many times we increased the amount of seedlings that we grow, but we've grown the seedling side of the business in order to take over her customers, and we've cut back on the amount of



produce that we do.

In fact, last year for the first time, we did not do commercial produce. What we did was we used the greenhouses and hoopouses. We silt them with seedlings, and then once everybody's planted their garden and cleaned us out, we plant produce for ourselves. Last year and going into this year, we're not selling produce right now just because getting on top of the magazine and also, I was writing and editing the book for the last ... We're really too busy and so this has been a good way to balance things out for us, and there's a lot of early season labor but then it's not as busy in the middle of the season as growing produce commercially.

Chris Blanchard: You took over as the owner of Growing for Market magazine. That's been two years ago now?

Andrew Mefferd: No, it's been just over one year. We just took it over at the beginning at the beginning of January of 2016.

Chris Blanchard: Okay.

Andrew Mefferd: It's been barely a year now. It still feels like a new thing for me. I'm definitely getting settled in there, but it's pretty new as far as endeavors go.

Chris Blanchard: Tell me a little bit about how you got involved with Growing for Market because Lynn Byczynski, the former owner of the magazine, she's out in Kansas.

Andrew Mefferd: Many years ago, when we were getting started with farming, one of the ways that we began to learn about farming was my father-in-law got us a beginner special from Growing for Market which is, if you know what that is, it's like the paper version of archive access. It's 10 years worth of printed copies bound into yearly volumes and so he got us that, and we just found it such a treasure trove of information. I had actually gone to school for journalism thinking that I would be either a journalist or a nonfiction writer.

I got more interested in farming partially because I started getting some journalism jobs, and I was spending all my time inside. I realized that that was just really stifling for me and also, we had this farm in the family that I got interested in. Also, I just was interested in being a part of providing a healthy food supply for people and so that's what led me down that route, but knowing about Growing for Market, I always had in the back of my mind, "Oh, gee. I'd love to write an article for Growing for Market," so for me, it's really kind of funny to have former aspirations of maybe writing an article for it and now having taken it over. I can't remember exactly when I met Lynn, but I traveled a lot when I worked for Johnny's and so at some point, I crossed paths with Lynn, who I should know is the founder of Growing for Market. She started it all by herself 25 years ago.



In fact, 2016 was the 25th year and so she had been doing it a long time and had started it. Whenever I met Lynn, I pitched an article to her about something or another. I think it was about picking tomato varieties or something because I had always had it in the back of my back to write for the magazine. I started writing for the magazine and had had maybe 10 or 15 articles in the magazine over the last five years or so when she, some point in early 2015, she asked me if I would be interested in taking it over from her. What she told me is that it was a small publication like we have. She thought it was important for the person who is editing the magazine to also be a writer for the magazine which if you're familiar with the publication she wrote a number of articles. She wrote pretty regularly for the magazine over the years which I should say I have not really done in the year that I've taken it over just because I've been so busy.

There's just all the first year business take over stuff that you would have to take over whether you were taking over a farm or a widget company or a magazine. Then there's just getting a good flow of articles coming and keeping in touch with everybody and just learning how to run the magazine has really kept me busy over the last year. Plus, I was editing my book at the same time, so this last year has just been crazy for me. It's been so many good things, but there's been a lot of things all together.

Chris Blanchard: You mentioned that you were working for Johnny's and traveling around the country. Can you tell me a little bit about what you were doing for them?

Andrew Mefferd: Yeah, sure. I'd love to. That was a great job because I'm definitely a plant nerd at heart. Shortly after we moved to Central Maine, Johnny's every year, we have this Common Ground Fair which people in the northeast might be familiar with. In fact, the Common Ground Fair was my first introduction to Maine. When I was working on this farm down in Pennsylvania, a friend of mine was, "You got to get up to the Common Ground Fair. It's like a country fair but everything's organic."

I don't even know what year that was, but I'd never been to Maine before and so I just threw a tent in the back of my station wagon and drove up to Maine because if you volunteer for the Common Ground Fair, you can have a free camping spot. What I did is I hiked it up to Maine and camped out. I worked in the kitchen every night so I could go to all the great farming presentations during the day and so I never thought, "Oh yeah, I'm going to move to Maine," but when that opportunity presented itself, I was already familiar. That was kind of a nice introduction to Maine.

Back to the connection with Johnny, so the Common Ground Fair is this huge deal in Maine. I think they have 60,000 people who come for something like that. In a state was only about a million people like Maine, it seems like everybody's there, so every year around Common Ground Fair time ... Johnny's is not that far away from where Common Ground Fair is and so they



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have a big sale every fall to just all the people who are going to the Common Ground Fair. That was the year that we had just moved to our farm and so we were trying to reestablish our farm. In fact, we trucked all of our equipment up from Pennsylvania. We had never sold it and so it's not we were starting with a hoe and nothing else, but we were in the process of reestablishing our farm after having worked for other people's for two years.

The Johnny's, both the warehouse retail store and their research farm is only about half an hour away from where we relocated to in Central Maine which turned out to be extremely serendipitous. That first year on our way to the Common Ground Fair we stopped in, and the former manager of the store named Joanne, she's a very outgoing person and so within a few minutes of stopping into the store, she had our life story. She was like, "Oh, you should work for Johnny's."

We both started out, my wife and I, we both started out working in the call center. We were commercial sales inbound reps, so we are the people who, if you're a commercial grower and you call Johnny's, we are the person on the other end of the line that says, "Hello, thank for calling Johnny's. How can I help you?"

They actually did segment the inbound reps. They wanted people with commercial growing experience to deal with the commercial farmers just so we could help with planting or varieties or whatever might come up over the course of the seed order so that very first winter that we were in Maine, the winter of '08 into 2009, I was doing that, working as a commercial inbound sales rep at Johnny's thinking that I would go back to farming full time in the spring. Over the course of that winter, the job for the tomato researcher became available. I love growing all the vegetables and flowers, too, but tomatoes have always just been my power crop. Tomatoes are my favorite thing and so when I found out that the job, that of a tomato researcher was available, I thought, "Well, that seems like this is an opportunity that's only going to knock once in life," and plus, we were in the process of restarting our farm. I realized that having an off-farm income would help us get up and going again.

By the tomato researcher, I should mention, the way a lot of seed companies do it, including Johnny's is they have people who run the trials and so technically, my job title was a trail technician. Basically, I ran variety trials, so it was my job to be aware of all the new tomato varieties that were being developed out there, get them into our trials, which we had trials there in, the town is Albion in Maine. We also had trials off-site in various locations, and I worked on other crops, too, but the longer I was there, we were just seeing more and more interest in protected culture. By protected culture, I mean greenhouses and hoopouses, okay?

Sometimes when I use the word hoopouse, people think I'm only talking about unheated production, sometimes when I say greenhouse, people think I



only mean heated, so what I'm trying to say is that we were seeing a lot of interested in all forms of protected culture. I worked this into the subtitle of my book. It's called the Greenhouse and Hoophouse Grower's Handbook, organic vegetable production using protected culture because this term protected culture is used a lot in Europe to mean both. Both greenhouse and hoophouse and so it's not used very much here and so I'm trying to get that into usage by using it a lot, protected culture.

When I started out at Johnny's, I was mostly doing field vegetables, and they would change from time to time, but I was always working on tomatoes and cucumbers in a various rotating host of other vegetables depending on what other people were doing. We're seeing so much interest in protected culture, I think partially because of the NRCS hoophouse program which was helping growers get grants to build hoophouses, and also, just because of the interest in local food. I say that I'm interested in protected culture because the more that you can extend your season, the more you can stretch out local food season.

If you think about that period from 2009 even till now, I feel like there's a great growing interest in local foods and so growers had demand. They had people who wanted to buy their stuff, they just had to figure out how to meet that demand and so I think that extending the season and greenhouses and hoophouses were a very important part of increasing the supply of locally grown produce and flowers to meet the demand. That's what I was doing at Johnny's. I was running trials literally to plant hundreds of tomato varieties and other crops, but there's more breeding for tomatoes than most other vegetables just because of the economic importance of tomatoes.

There's a lot of energy that goes into tomato breeding, so I would run these trials with two and sometimes even 300 varieties of field tomatoes and then I would run a corresponding greenhouse or hoophouse tomato trial with fewer varieties just because it's a more specialized market, and that really scratched an itch for me. I think most gardeners or farmers open up their seed catalog and they get the inclination, they want to plant one of everything, right?

Chris Blanchard: Right, yeah.

Andrew Mefferd: I think we got to do that. My job was to seek out every variety possible, plant them all that made sense. There's probably not enough space in the world to plant all the tomatoes' varieties that are out there, but I had to determine the ones that would be of interest to small, medium-sized farmers and gardeners and grow all the ones that they would be interested in and grow them side to side and compare them. That's really the only way to tell how good something is to grow it next to competitors and then evaluate it. That was an awesome job for me just because I'm such a plant nerd. I could just grow all these different varieties and try to evaluate them.

The other side of my job there was to troubleshoot growers' problems. I was



supposed to stay on the cutting edge of whatever the market farm technology was at the time in order to be able to answer people's questions about it and so that was a great place for me to be. On the one hand, I was running a farm half an hour away, a market farm, where we were doing just that, we were selling produce. Then my day job, I was running trials and I was giving access to all kinds of interesting researchers and commercial growers and things.

A lot of times what would happen is somebody would ask me a question that I didn't know the answer to, but I had an amazing array of people at my disposal that I could go ask. In fact, that's one of the ways that the book came about because I felt I got a lot of questions just over and over again, and we have a saying at the farmers market. We certainly didn't coin it, I don't know who did, but one of the things we say at the farmers market is if you get the same question over and over again, it's time to make a sign.

Chris Blanchard: Right.

Andrew Mefferd: The way I took that from a farming information perspective was if I got the same question over and over and over again from a grower, it's probably the time to write a book because that most identify a common area of that A, people want to know about, and B, that they don't know about. If you get the question over and over again, that information must not be out there, must not be satisfying people. I had the thought in my head a few times after answering these grower questions that I would get over and over again. "Oh wow, somebody should really write a book about this stuff. Somebody should write this stuff down," before I realized, "Well, maybe I should just start doing that," and so that's in large part where the book came from.

Chris Blanchard: I have to say, this is a great book. I remember back when I started at Rock Spring Farm. I owned the farm 1999 and the 2000s. There was some good information about organic production for doing winter production, doing the salad crops, but there was mostly just introductory stuff as far as the other, the summer crops go, the things that actually made us the most money. Yet, we were turning to sources about the hydroponic production. That's what we had to look at because there weren't technical manuals available for doing organic production of summer crops, and I had a look over this book, and this is fantastic. It's really, I loved how that it's so short on the rah-rah, you can do it, and it's long on the real how-tos. The nuts and bolts of how do I actually produce greenhouse tomatoes like a professional grower instead of like somebody who's growing some tomatoes in a hoop house, you know?

Andrew Mefferd: Yeah, exactly. I want it to be an extremely practical book. I realized that's what growers need is that when they have a question to go answer it and so that's why it's not a comprehensive rundown on every single crop. What it is is the details on each crop that is what keep most of the greenhouses out there in business. In fact, the subtitle is best practices for the most profitable crops. The way that I came up with that group of crops is because over and over again, I would go to commercial greenhouses, and they were growing eight



crops. They were growing ... I divide them into two groups. I have a vining fruiting group and a leafy group. On the vining fruiting group, everybody's growing tomatoes, cucumbers, peppers, and eggplant. On the leafy side, everybody's growing lettuce, mixed greens, micro greens, or herbs, predominantly basil, and so just that selection of crops.

I wanted to help especially people who haven't grown it in a greenhouse or hoopouses before. That's who put them on the trail to, these are really the things to be considering if you just bought a hoopouse or if you're trying to fine-tune your production. These are the eight things that are most likely to pay off that expense and pay you back for the investment in that protected space and so yeah, I want it to be very specific. What was happening is ... I'd worked on farms in Pennsylvania, California, Washington State, Virginia, upstate New York, and Maine. In fact, I think, all of the farms that I worked on except for maybe one had a greenhouse or hoopouses.

Most of the farms that I worked on, and one of the other great things about working at Johnny's is I got to go on a lot of farm floors which I love. Just going and meeting people and seeing the different ways that they grow. To a great degree, what keeps growing interesting for me is that everyone does it a little bit differently. What I like to say is that there is many ways to farm as there are farmers. That was just great for me to be able to go visit people, but after I started getting access to these research greenhouses and big commercial greenhouses in places like that, I realized that most of the smaller growers were basically just growing field style in a hoopouse or a greenhouse. I didn't realize there was any other way to grow until I was exposed to the alternative. I realized that there's this other method that's largely Dutch that's totally different.

I started going to these big commercial greenhouses that were more or less growing with the Dutch style. You'd be surprised, or maybe you wouldn't that some of these greenhouses that the growers were first generation Dutch. They had greenhouse publications written in Dutch lying around, and they were mostly very open to me, and I was able to ask them some great questions. In fact, one of the analogies that I talk about in the book is about how most years, including 2015, which is the year we have the most recent statistics for. The United States is the number one agricultural exporter in the world and the Dutch are number two. This is typical. Most years, this is a pattern. The US is number one and the Dutch are second.

It's comparing apples and oranges, though, because Holland is about two-thirds the size of West Virginia. That's an analogy that I want smaller growers to take away here because how a part of the world that's two-thirds the size of West Virginia can come in second to the United States in agricultural exports is a message. It means you don't have to be big to get a lot done, to be productive. All you have to be is smart and efficient. The way that Dutch come in second to the United States is exactly the way that I want smaller growers to take over more of the market share of the food that's



being produced. The way that I look at it, most of the food that's eaten in this country travels a very long distance. That's one of the changes that I want to see in the world is that more of our foods come from closer to where it's eaten.

The way the Dutch do this, which is the way that I want local growers to do this is they are small, but they plant very densely and they focus on high-value crop, vegetables, leafy greens, and flowers. That's one way that I can see smaller growers who don't have a lot of acreage getting a lot done and being profitable and staying in business.

Chris Blanchard: Tell me what's different when you go into a Dutch greenhouse versus the average market farmers' high-tunnel production.

Andrew Mefferd: Chris, the most basic thing. If you told me that your line was going to cut out in one minute and I have a minute to tell you anything that I'd like to pass on, what I'd like to say is to plant more densely. The first time I ever went into a Dutch greenhouse, the plants are tall because they build taller greenhouses because of larger air mass is more efficient to heat which is counterintuitive, right? They used to build greenhouses really low. In fact, I'm just over six feet, and some of these old greenhouses, I almost can't walk around in there without bumping my head because the old thinking was that you build a small of structure as possible so you have a small an area as possible to heat. What we've realized is that bigger structures are actually more efficient because once you get that big air mass up to temperature, it's more efficient to keep a larger air mass at temperature.

One thing, they're really tall, but the thing that's really useful for smaller growers is they're very densely planted. Doesn't matter if it's vining fruiting crop like the tomatoes or the leafy crops. The basis of everything, if you have people listening to this interview and go, take anything else away from this that I would say plant more densely. It's a no-brainer, right? You plant more densely, and you get more plants in a certain space and you'll get more yield out.

The most basic change I could say is people, if you're growing single rows, switch to double rows. You can take whatever crop you're growing at whatever spacing you're currently comfortable with, and if you switch it from one single row on a bed to two rows on bed, obviously, that halves the amount of your protected space that is devoted to plants and doubles the amount of plants in your house.

Okay, so a very specific example from my own production is when we started out, most of our houses are 30-feet wide. We would run five beds for the vining fruiting crops, so it's like tomatoes and cucumbers. We would run five beds with a single row of plants down each bed. What we ended up with after trying all these ideas is the same number of beds, okay? We went from five beds with a single row down the middle to five beds with two rows spaced out



two feet apart down each bed. Doing that along with the other stuff that I talk about in the book, we went from getting about a ton of tomatoes out of one of these tunnels to two tons. We literally doubled our yield by making these changes.

Spacing is the basis. The bottom line is just getting more plants in there. Now, all the other stuff that I talk about in the book supports the spacing, and that's where you get into pruning to promote airflow and having horizontal airflow fans to promote airflow, so that's one good way to look at it. The basis of the whole thing is very dense planting, and then a lot of the other information is supporting it so that you get the most out of that spacing.

It doesn't just apply to vining fruiting crops. People are out there thinking, "Well, I grow a lot of salad crops," or greens or anything. You could apply this principle to any crop. On the leafy crops, if you can grow a more compact framed lettuce so you can plant at eight inches instead of 12 or even go down to six inches instead of eight, if your market will accept a mini head lettuce, you can get a geometrically higher number of plants into a given bed if you can just tighten up your plant spacing which might involve switching varieties.

That's why one of the things that the leafy crops are bred for when they're bred for greenhouse or hoop house growing is compact transplant. You can either grow a Black-Seeded Simpson or something and get a pound or a pound and a half of lettuce into a 12-inch spacing or you can grow some really compact butterhead variety or something and get a pound of lettuce into eight inches. That's a little chart that I did in the book. It's super simple. Anybody could do it themselves. It's just take one of your beds, do the math on how many plants you get at a one-foot spacing, and then do the math on how many plants at eight-inch spacing and six-inch spacing.

Then if you're heating a greenhouse, multiply it by 10, and that's when you really see the difference. You get so many more plants at eight or six inches. Each bed you grow is more profitable. Then if you're heating a greenhouse, you might actually get nine or 10 cycles of crops and so you multiply that difference by 10, and it's a huge difference by the end of the year. Those are the kinds of things that greenhouse growers do, just the basics to be more profitable. Although, this book, it's 250 pages of greenhouse information which is, it's really nice for me because a lot of times I would go and have an hour at a conference or something. I would get a chance to talk to growers, and I would feel like you just can't do anything but scratch the surface in the area. That's one of the other reasons that I like the longer format of the book because you can tell I'm very passionate about it, and I really enjoyed learning about it. There's just so much there, there's no way you can get to it all in an hour or anything like that.

There's some really basic stuff in there like denser spacing, using light covering in the bottom of the greenhouse to help reflect more light and keep the temperatures cool, using pulse irrigation to prevent splitting in tomatoes and



reduce root diseases, insect netting, record keeping. There's some very basic stuff, and then there's also some very advanced stuff. I've spent a lot of time in the book on grafting because I probably got more questions about grafting than anything else while I was at Johnny's, and that partially hint at the complexity of the grafting but also that's one thing I can't talk enough about. Grafting has helped my tomato production immensely, so as far as more advanced topics, there's the grafting, there's talking about pre-day and pre-night treatments on fruiting crops, crop steering, carbon dioxide augmentation, so this book is really ...

What I wanted was for someone to be able to buy this book as a beginner and almost learn with the book. If you've never had a greenhouse or hoop house before and you just want answer to the question how many lettuce plants should I put in this bed or how densely should I plant my tomatoes, it's there for you. Then as you get to be a more accomplished grower and move into the medium and advanced, advanced topics that you're probably not going to be doing, pre-night treatments and generative steering on your plants in your first year, but if you get a few years under your belt and really want to dial in your production, those are the kind of things you want to do. I tried to kind of arm-load as much as I possibly could the information that's really specific about all these crops to protected it growing.

Chris Blanchard: I'm really interested. You've mentioned these two topics a couple of times, and there are things that ... I feel silly saying this, but they're not things that I had heard of before. You talked about pre-night and pre-day treatments, you talked about generative steering. Can you tell us a little bit more about those tools and how those work?

Andrew Mefferd: Absolutely. I'd love to. In fact, this idea of pre-night treatments, the two ideas are tied together, and I think you're right, Chris. I think most people have never heard of this. They've never heard of pre-day, pre-night treatments, and crop steering, but if you look in all the greenhouse literature that's coming out of Holland, I would say, I do think that Europe is ahead of us on a lot of this stuff. A lot of the literature that read to be able to write this book is coming out of Europe and so I'm actually really glad that you asked about pre-night treatments and crop steering because this is a subject that makes my inner plant geek happy. It'll make more sense once I've explained it.

Pre-night treatments are one of the main techniques for steering. What I mean by steering is that if you've got your greenhouse, particularly your greenhouse production because it helps to have heat to do these things, if you've got it pretty well dialed in, really the icing on the cake is steering. What we mean by that is if plants are too vegetative, if they're too leafy, they're making leaves at the expense of fruit production. If you think, "I don't even know what that is," you do. If you've ever planted a transplant into a compost pile or if you've ever fertilized, you know what being overly vegetative is. It's when your tomato plants in particular or fruiting crops in general, when they have huge beautiful looking leaves and the fruit is really small and late to



develop, that is overly vegetative.

I saw this personally in my own hoopouses before I really even knew what it was and so that's part of the value of writing about this I think is it's the kind of thing if you're an experienced grower, you've probably seen your plants in an excessively vegetative state. You may not have even known what to call it, and you probably didn't know what to do about it, so steering is what they call moving your plants back to a state of balance. I would say the two extremes on the continuum are for plants to either be vegetative, making too much of leafy parts of the plants or generative, making too much of the fruiting parts of the plant at the expense of the long-term health of the plant. As with so many things in life, what you're really shooting for is balance. If you don't know how to achieve that balance, you're probably not going to get there and so I have a lot of other suggestions on the book. There are a lot of things you can do to try and create balance in plants.

One of the most dramatic and one of the most useful steering tools is to use heat in a greenhouse and use a pre-night treatment. This is where I love the greenhouse research, and it just tickles my inner plant nerd because what they realized, there's so much energy going into tomato production in particular and fruiting crops in general. They realized that the warmest part of the plants keep respiring longer than the colder part of the plants when the temperature drops at the end of the day when the sun is going down. That's should really be a no-brainer because if you think about it, the warmer parts of the plants are respiring faster. You could say, "Well, that's an interesting plant fact, so what?" Well, greenhouse researchers figured out how to use that because what you can do is, I tell growers, instead of ...

I think most growers gradually let the temperature fall at night to a lower night planned temperature. Either that or they just shut vents up and try and keep the temperature from falling as slowly as possible to conserve as much heat as possible, but the way that you can drive more energy to those fruits in your plants, and it actually can improve the flavor, too. This is one of those few techniques that improves both production and flavor is by letting the temperature drop very suddenly at night. In fact, my advice for growers who are interested in doing this is leave your vents open until you get to a particular set point, and what that temperature is varies a little bit based on the crop.

That's where also having some degree of automation in the greenhouse can help because what you can do is, instead of just shutting the vents up right before the sun goes down to conserve as much heat as possible, if someone wanted to do this and make their plants more generative, make the plants focus on fruit more which should result in a higher yield, is leave the vents open, set up a lowest set point on your thermostat and so that when the environment in the greenhouse reaches its level, then the vents close and the heater come on to prevent the temperature going below your set point. What this does is you will have to spend a little bit more energy on heating the



greenhouse because you lose more heat than if you shut the vents up promptly. But it actually pays for itself in increased fruit production and quite possibly in increased flavor.

This is the part that I think is interesting. What happens is because the leaves and the vine of the fruit have so much less water in them, they have so much less mass, right? And of course, water changes temperature more slowly than the air, and smaller masses of water change the temperature more quickly than larger masses. What happens in the evening is that the air temperature cools down really quickly, and that makes the leaves and stems cool down pretty quickly. What are the largest masses of water in your greenhouse are the fruits, so the fruits stay warm, and that means when the fruits stay warm, they're pulling what we call the assimilate.

Basically, the food that the plant has made through photosynthesis throughout the day, so as long as they're warm there's still saying, "Feed me. Send me the sugars," so how that improves your tomato flavor is that at the end of the day, that clears out your plant. It makes the fruits pull all the assimilates and all the sugars that are in the plant and then that's how it makes them more generative because you choose which part of the plant is getting the energy. Likewise, the pre-day treatment, it doesn't have to do with steering but what it means is that, it basically means you heat up the greenhouse earlier than the sun does. Once again, this is counterintuitive in a way because it means a lot of growers would try and save money and use a minimal amount of heat until the sun comes up, and say, "All right. The sun will warm my greenhouse up in the morning," right?

Chris Blanchard: Right.

Andrew Mefferd: That's true, but it's also going to make a lot of condensation in your greenhouse because once again, what happens is if your greenhouse is cool overnight plus the plants are respiring, so you probably got the vents shut up. They're transpiring moisture out into the greenhouse environment which you have closed up, so you're getting this massive air inside of your greenhouse that's getting more and more humid over the course of the evening. Then all of a sudden, the sun hits your greenhouse. If you're a greenhouse grower out there, you've probably been in your greenhouse when the sun comes up because you're working hard and you know that it almost flips a switch. The temperature is just going to spike and so the opposite effect happens in the morning time then when your greenhouse is cooling down at night whereas the ...

Okay, so the sun hits the greenhouse. The air warms up really quickly, and then the plants stay cold because they're full of water. Plus, you have this humid air mass. It's the perfect setup for condensation because what happens is then you get all this warm humid air surrounding these cold plants, and if you've been in your greenhouse in the morning and it looks like it's raining, that's what's going on. You've created the perfect conditions for



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condensation, and as you may know, there are a lot of foliages either in all the rocks and molds and things are promoted by condensation and wet leaves. In fact, I'd say that's one of the biggest advantages of having a greenhouse or a hoop house. That applies whether you have heat or not.

One of your biggest advantages as a protected grower is just keeping the rain off. Heat is important, and that's the first thing everybody thinks about is, "Well, it's warmer." I'd say it's just as important to keep everything dry because all our plants have leaves. Keeping them dry is going to keep them healthier, so what I mean by pre-day treatment is that I recommend people about two hours before the sun is going to come up to set their greenhouse thermostat, to start ramping temperatures up, so whatever your desired daytime temperature is, it's there when the sun comes up. This is the way you, you base your planting based on what time sun rises, and you count backwards two hours and just ramp the temperature up. Let's say ...

If people ask me, hey, I want to grow tomatoes, I don't want to do the whole complicated temperature schedule, I just want to pick a daytime temperature and a nighttime temperature. You could do worse than to set your nighttime temperature at 65 and your daytime temperature for 75. Let's say people knew they wanted their greenhouse to be 75 degrees during the day. I would say ramp it up. Starting two hours before sunrise, ramp it up so that at sunrise it's 75 degrees. That's an oversimplification.

Every crop that I deal with there's a temperature graph, and we deal with high and low temperatures and how that ideal climate should be to make each crop ideally happy, but also, not everybody wants to get that complicated. A lot of people just want a nighttime number and a daytime number. That's one way you can still do some of these more advanced techniques without getting too deep in the weeds of what temperature this time and everything. Just knowing that you could heat your greenhouse up before the sun comes up and avoid a whole lot of your disease problems would be a huge help to a lot of growers.

Chris Blanchard:

Okay, with that, we're going to stop here. We're going to get a quick word for our sponsors, and then we'll be right back with Andrew Mefferd from Growing for Market and One Drop Farm in Cornville, Maine.

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We're back with Andrew Mefferd from Growing for Market magazine and One Drop Farm in Cornville, Maine. Andrew, before the break, we were talking about some fairly technical stuff having to do with steering your crops particularly using temperature as a way to help balance out the fruiting and the vegetative growth in something like a tomato crop or cucumber crop. You were talking about heating up the greenhouse before the sun comes up, you were talking about maybe dropping the temperature faster when the sun goes down, but all of these things, as I'm thinking back on my hoopouses experience, and I felt like I was a fairly sophisticated high tunnel growers, and we had pretty high-tech greenhouses, but we were up there rolling sides up and down by hand. It wasn't like we were going to get up at two hours before sunrise and try to make something different happen with how we had things adjusted in our tunnels.

Can you talk a little bit about the return on investment or doing some of the automation? Now even automation but you were talking about denser planting and therefore having horizontal airflow fans to move the air around, keep disease under control. Can you talk about that investment versus what you're going to get in increased yield? Is the ROI there on this stuff?

Andrew Mefferd:

Yes. Yeah, I've got two things, two ways to address that, Chris. One thing I say, yeah, the return on investment is definitely there. I would say that growing is a continuum and that the fancier greenhouse which I call high-tech greenhouses, they're higher investment and they're higher return. We wouldn't have growers out there that were in business if they weren't. In fact, the places that I learned a lot of these techniques were some very large greenhouses. In fact, I had never been in places like this till I was at Johnny's. I'd go into greenhouses that were 10, 20, 40. I've been in greenhouse complexes that were a hundred acres which really kind of blows my mind when you think about it because you go in there and you can't see the ends of the greenhouse. My farm, we have almost a hundred acres on my farm and so



that would be like imagining my whole farm under a glass. They definitely don't stay in business doing all this stuff because they're losing money on it. I think the real question was does this stuff translate?

In fact, I've definitely experienced some skepticism from some people, like, "Well, that's different because it's greenhouse," or because they're big commercial growers. That doesn't translate down to a smaller scale. What I can say about that Chris is that if I had not been farming at the same time that I was working at Johnny's and seeing all this stuff, there would be no book. It wouldn't really be interesting just to write, oh, all this stuff exists. The thing that makes this book interesting is that I tried it all out on my own farm because I had some of that skepticism myself. In fact, it was a leap of faith for me to go from my old planting as I was telling you about where I had five singled rows.

In fact, I did baby steps. What I did was I went from five single rows to four double rows to five double rows. It was a process where I went from, I didn't go straight up to the highest planting density that I ended up using, which I will say was in a hoop house, and we used a very similar, about the same planting density that a lot of big greenhouses use for beefsteak tomatoes which I can say pretty quickly. That would be growing two rows on a bed that the rows are two feet apart with plants or head if you're using double-headed plants. Plants or head, your plants spacing should be about a foot apart in the row with two rows of tomatoes two feet apart on a bed with a three-foot walkway. Right there, that's your fairly typical big greenhouse beefsteak tomato spacing.

Like anything else, it gets more complicated, you may be able to cram cherry tomatoes in even more, there may be ways that you were going to change that, but most of my fruiting crop production over the years has been personally in hoop houses. That's where I can say with confidence to people this stuff works because I did it, and there are always things that you can do to make things more complex. I would say to people if you're building a hoop house on your farm and you have an electrical hookup and a water hookup close by, I would say it definitely pays to do all that stuff. You can have horizontal airflow fans. In our hoop houses we have endwall vents that are on a thermostat, so we could be working on the back forty and once the sun comes out, we don't have to run back up to the house to open the vents.

I know the original idea behind the hoop house was you have some bows and a layer of plastic and a door. I think that's really useful. I think that growers can still get a lot of mileage out of just a very simple hoop house, and I do talk about, in the book, which of these techniques apply to greenhouse and which to hoop house. For the most part, it's really simple. The ones that need heat are for greenhouse only, and the ones that don't ... Most of the techniques in this book could be used by either, and that's why when they were talking about a title for this thing, I was really specific. I wanted it to be called what it is, the greenhouse and hoop house grower's handbook because I feel like the



widest group of techniques is available to everybody.

For example, if you wanted to break it down Chris, and a useful example, what's something that is taken from a higher tech growing that could be used in a hoophouse with no electricity? Well, the greenhouse pruning and trellising technique because I still think that growers in hoophouses with no electricity should be planting more densely. What they can do without any horizontal airflow fans or anything else to support it is they can prune and trellis, and out there pruning and trellis are supporting techniques for the higher planting densities, right? They take the leaves off from the bottom of the plant which creates airflow down to the base where you're most likely to have dead air and high humidity and disease is forming. Then air can circulate, tomatoes ripen faster when they're warmer, so you take them out of that little micro climate that forms when the tomatoes are nestled in the leaves. The trellising just helps you distribute that plant growth over a longer season literally putting a plant over a larger space. Instead of letting them ...

Think about it. The alternative would be to let them spill all over the place which works well for bush tomatoes, but if you want to grow a tomato plant for five or six months, you can't just have it spilling all over its neighbor, so that's why I say there's a lot of what I call plant husbandry. Taking care of plants. That's one of the interesting things to me about the Dutch system is that it's not like some other farming. If you were to look at how the large-scale row crop farmers stay in business, I think you'd see a lot more about consolidating fields so they're really big, so then you can have a really big tractor. Now, that's on GPS, and you might have a really low margin, but you're producing a lot, and you benefit from being able to buy supplies and sell on it to kind of give scale, right?

That's not the scenario that I see or even would encourage local or smaller farmers to start producing. I want local smaller farmers to be getting a decent margin for what they're working hard to produce, and that actually moves over into the greenhouse range or maybe I should say that the larger greenhouses translate better than smaller houses because they're still doing things by hand. Even the biggest greenhouse, there's a little bit of mechanization for just transporting things around in the greenhouse, but they still have huge work crews. One of the ways you can see this is that most greenhouse growers that I talk to, their number one cost, people think it's heat, it's labor.

I can't think of a greenhouse grower that I've talked to that deviates from that. They're paying the people to take care of the plants, and it's not unskilled labor. People have to understand how to recognize and take care of these plants and so that's why I say that a lot of the techniques, accepting the things that you translate over into very simple hoophouse. Just like I was doing a conference the other day and telling the people about increasing their spacing. One person said, "I'm scared." I think they're scared of getting diseases by cramming the plants in tighter. I'd say that if you can prune the



plants for good airflow, it would help to have HAF [Horizontal Air Flow] fans but if you don't want to have electricity or you're just placed out in the middle of nowhere, it doesn't mean that this stuff in this book doesn't apply to you. It means there's a lot of other stuff that you can do to help your plants not get diseased even in the absence of electricity and air circulation.

Chris Blanchard: Yeah, because I know that's always a big deal for us in the high tunnel was we could keep the diseases under control. We had massive production whether we are talking about cucumbers or Sungold cherry tomatoes. Once the diseases set in, then you're just fighting a losing battle. It was like a rear guard action at that point.

Andrew Mefferd: Yeah. One of the other things that I say about that in this book is to consider the use of greenhouse variety. Of course, that's something I was really steeped in while I was working at Johnny's. For a number of years, I was seeing all the new varieties, and I have no connection there other than some friends. I'm not trying to sell seeds, but I always tell people consider some greenhouse variety. I say don't take it from me, try some of them out. Particularly if you're growing a field variety in your protected culture, your tunnel, your greenhouse. One of the biggest reasons to try the greenhouse variety is because there's some really specific diseases like leaf mold comes to mind. I've never seen leaf mold on a tomato out in the field, see it in protected culture all the time. Down in my farm, we had two or three great years, and this is really typical.

First couple of years, we grew in our high tunnels no leaf mold, and then I think in year number three, we got it right at the end of season. Every season since, it comes back because it's spore-based disease that the spores are just in our high tunnel now. Leaf mold is one of those things. You never see leaf mold resistances in field tomatoes, and it's one of the most common things ... To my mind, it separates a greenhouse tomato from a field tomato that they have leaf mold resistance, and I'm not saying that everybody has to grow all greenhouse variety.

This is one area where I certainly don't take all of my own advice because typically, what I would do is I would plant our tunnels roughly 50/50. I would do half greenhouse beefsteaks, and I would do half heirlooms. It's not that I didn't grow any cherries, but in my part of Central Maine, the season is just so short, I feel like it does not return. You're rolling the dice if you're going to make any money at all on large-fruited tomatoes out in the field just because big beefsteaks take so long to get going, and they take so long to ripen that I feel like it's getting cold again where I live by the time they're starting to ripen. After trying that for a few years, I just totally gave up on the large fruited tomatoes out in the field, so I still grow the cherries and grapes out in the field, but I just moved a large fruited production into the hoophouse.

Chris Blanchard: Let's turn a little bit away talking about the fruiting crops. I know one of the challenges that people are going to be facing here at about the time this



episode goes live is that the days are getting longer very quickly in early March. Things are heating up very rapidly in the high tunnel. I know therefore a lot of the greens that are there and that you'd like to get maybe another month's worth of harvest off of before you're coming out with your greenhouse tomatoes, your greenhouse cucumbers. What can people do to help mitigate bolting? Help keep that from happening for a little bit longer?

Andrew Mefferd:

For one thing, we were just talking about the greenhouse varieties. Greenhouse varieties do tend to be selected to be bolt resistant because it's those high temperatures that tend to initiate bolting in all the leafy crops that we don't bolt, right? The temperature spread, really, all the leafy crops are, whether they're for field or for greenhouse that are selected not to bolt as much as possible. Especially greenhouse crops, they select them especially for that because your temperature spread over a 24-hour period is likely to be a bigger spread in protected culture than in the field. Hoophouses are really the best example of this because hoophouse, you're likely to be getting down to if not right at the same temperature that your nighttime temperature is, but as soon as the sun comes out, it's going to be hotter in there than whatever the outside temperature is and so they know that protected culture varieties, I should say varieties that are bred specifically for protected culture, needs to be able to deal with these temporary fluctuations in hotter temperatures than field varieties and so variety selection would be a big deal.

Essentially, some temperature and humidity management, even if you don't have any heat, if you are up early in the morning, one thing you could do would be to go out and roll up your sides. That will just reduce the spike in addition to the humidity in temperatures which should help your greens stick around a little bit longer. One of the things that I do talk about in the book is that plants are a lot like us. They don't want to be shocked. They want transitions to be gradual, and that why with the pre-day treatment I talked about starting two hours before the sun comes up just to raise the temperature in your greenhouse. You could probably get it up to whatever temperature you wanted your daytime temperature to be faster than that, but it would be more of a shock to the plant and so the more shocks that your plants have, the more likely they're going to say, "All right, I'm done. I'm making seeds," and start bolting and getting out of there.

Even unheated growers, that might be something. If you're up before the sun comes up, you could roll up the sides. Actually, that's one thing that I would do to try to minimize the amount of humidity because once again, I was growing fruiting crops in unheated houses, so I didn't have that luxury most of the time of raising the temperature before it went up itself, but what I could do, which may sound counterintuitive in a way, is to roll up the sides before the sun came up. I figure by the very early hours of the morning, your hoophouse is probably very close to the nighttime temperature anyway, so you're not losing much heat to roll up the sides, and you're letting out a bunch of stale air and reducing that temperature spike. Those would be my advice for trying to keep your greens stick around and manage your temperature and



humidity.

Chris Blanchard: Awesome. I know that'll be an advantage for a lot of people that are listening to just go in with that one little quick tip. I think what you said is actually really important and kind of runs a little bit counter to what we're oftentimes thinking of in the spring. We're thinking about wanting things to be warming up in that greenhouse, but now we're talking about keeping things cool and taking some active measures to manage those spring crops. I'm imagining that open things up in the morning and then you might roll those sides back down or at least not leave the open all the way as things heat up outdoors during the day.

Andrew Mefferd: Yeah. Absolutely. It's the kind of thing that you would do as needed depending on how overcast or not it was throughout the day.

Chris Blanchard: I want to pivot here away from talking about the greenhouse, and I want to talk a little bit about Growing for Market because I actually think your experience Growing for Market's really interesting. It's similar to what a lot of people are facing when they talk about doing farm succession. Transferring farm ownership from one person to another because Growing for Market, you said 25 years under Lynn's ownership and management. I don't know about the rest of the world, but I really closely identified Growing for Market with Lynn, and I did a lot of writing for the magazine at one point. I've been in communication with Lynn as a workshop organizer and in other capacities. Wow, I always thought Growing for Market, Lynn Byczynski. Now I'm thinking Growing for Market, Andrew Mefferd. What's been like taking over a business that was so strongly identified with somebody else?

Andrew Mefferd: Yeah, that's a great question Chris, because everybody knew Lynn because she just did it for such a long time, and she was such a presence in the magazine. She did a lot of writing for the magazine over the years and so I guess it has been a little bit of an adjustment, but I feel like most people have stuck with it, and I really don't want it to be about me. I want to be the person who's making it happen every month, but much like your own podcast Chris, it's really the product of the people that you have on it.

What I want to do is to finesse growers because many of us are out in rural areas where may or may not have neighbors who are doing similar things. The transfer of ideas and technology is, they're just so important because farmers are such innovative inventive people. I don't want the thing that one person is doing somewhere on their farm just to stay there. I want to help transfer ideas when people want to share them which I find is most of the time because I think most direct market growers are very sharing, giving people. They care about what they're doing for more than just their own business and because I found people to be very forthcoming about their techniques and what they're doing.

In a way, I think that's one of the reason that your podcast is great, Chris,



because everybody's a ... Not everybody who's doing something that other people should hear about is in a position to say write an article for Growing for Market and so I'm glad you're doing what you're doing as far as getting in touch with these people. That's how I look at my job is I'm trying to find the people who can write about it or as I mentioned in the beginning of the show, one of the things Lynn wanted me to do is keep writing for the magazine even while I'm really doing the editing.

I think I look at my job as I really should not be visible for most of the time. I should be the person who's in the back and just making it come together. Most of the time, people don't really even think about how it came together. It's just, "Oh hey, my Growing for Market came in the mail. I got an email that my download is ready." If I'm doing my job well, people shouldn't be thinking about how it comes together, they should be thinking, "Oh, great. Another informative, practical version of Growing for Market." I really don't want it to be about me except when I'm writing something in the magazine. I think it's really more about the relationship that I can cultivate with people who are out there because, of course, I can't be everywhere at once.

I know a lot of growers and extension agents and all the different people who are active in direct market farming, and I want to build the relationships so that when somebody is on a farm tour or have a presentation and see something really inventive or really useful that they'll say, "Hey, Andrew, I found this great thing. This should really be in your magazine," and write about it or put me on the trail so that I can track it down and get it in the magazine one way or the other.

I definitely want to give Lynn credit for having the vision. That's a long time, 25 years, so 2016 was our 25th year. We're in the beginning of our 26th year now, so I think Lynn definitely deserves to be associated with the magazine as the founder and having run it for 25 years. That's awesome, and I just can't thank her enough for thinking of me when she wanted to pass it on because it's pretty much my favorite publication, so I thought ... That's another one of those opportunities. You're never going to get offered the opportunity to take over your favorite publication again in life and so that's one the reasons even though I really liked my job at Johnny's. It was very interesting. I left that to do this also because I think Growing for Market is a really important resource for growers.

I think that direct market farming is such a specific thing. It's so different from commodity farming or other things, and there's so much development as far as marketing business and just the growing technique. All that stuff has come such a long way over the past 25 years, over the time that the magazine has been around. In fact, that's are roughly the period when USDA started keeping track of the number of farmers markets, right? I believe it was 20, 21 years ago that they started keeping track of the number of farmers markets, and over that time, the number of farmers markets has quintupled. There's been a huge change. Those are the people that we're writing for, right? There's



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people who are doing farmers markets, CSA stand, local wholesaling like we were and so the fact that audience has quintupled, and it's continuing to grow is just huge news.

I think that the fact that the landscape has changed that much means that it's a different thing to be growing for market in 2017 than it was in the late 90s. That's what we need to be ... We just need to be in touch and writing about the right thing. That's why almost any time I get to talk to a subscriber or someone who's interested in subscribing is I say, "Let me know if you have ideas." I'm not asking for you to write the article, but I'm always trying to figure out what people want to hear about and say, "Just let me know if there's something that you wish we were writing about, that's what I need to know because that's what we need to be writing about." I'm very excited about the opportunity to steward Growing for Market into a second 25 years and just keep it an important resource for growers just like it was for us coming up in the direct market growing world.

Chris Blanchard:

I know when I first heard about it back in 1993, I was working at Harmony Valley Farm in Viroqua, Wisconsin, and Richard de Wilde came to me, and he said, "Okay, you have to read this magazine, and you have to subscribe to this magazine," and I think I've had a subscription pretty much the whole time since then whether I was actively farming for myself or not because it was such a fertile source of information.

Andrew, we've talked a lot about growing the actual crops, but most greenhouse crops, I think it's fair to say, are grown from transplants, and of course, here we are going live late February, early March, I haven't decided yet, but we're going to be talking to a lot of folks while they're working in their greenhouses, growing transplant. Are there things that you do differently to grow transplant for protected culture than what you would do to grow something for outside?

Andrew Mefferd:

Yeah, there are some things. As I mentioned, we are heavier into seedlings now than we once were and so we do go through a lot of potting mix, and we do use a compost-based soil mix to start all the plants. We've also been adding a mycorrhizal inoculant the past few years, and we may not even see the benefit of that so much in our own transplants, but we figured that's something that we can pass onto our customers as well because if the plug is inoculated with beneficial mycorrhizal fungi, then that should grow out into the area and help the plant, wherever someone plants it.

One thing that definitely is a little different is that a lot of greenhouse growers grow their transplants much larger than the transplants that are to be used for sale production. For one thing, because the transplants for protected culture, they are not going to have to deal with as much wind and rain and all the rough weather. The leaf, they're under plastics and even winds are usually mitigated somewhat by the structure. You can grow a bigger plant because it's not going to go out, you're not going to have this floppy plant that



immediately gets hit with wind and strong sunlight. That's another good point to make. Even the clearest coating filters out some light and so the light isn't as harsh, protects the culture as well, so I would say ...

That also contributes to early is that if you can plant a bigger plant, of course, you're going to be closer to the harvest state. I'm talking particularly about the fruiting crops there. I would say transplants the leafy crop so more similar to field crops.

Chris Blanchard: What are the factors that you think are the most imp in producing a really high-quality transplant?

Andrew Mefferd: That's a good question. I'd say that having good temperature would be one thing as far as ... Both not too cold but also not too hot because one thing that we found is that if you grow the transplants really hot and with a lot of fertility, they can be too vegetative. They could be too awash and not only be susceptible to pests as far as, we all know that aphids really love that lush soft growth. Plants that have been grown too hot and with too much fertility are really not going to be as strong as plants that have been grown with more moderate levels of both heat and fertility and so I will say I do ...

In the book, I have temperature graphs for each crop that I deal with at each stage of growth, so there's a graph for germination, there's a graph for transplant raising et cetera, so I have pretty specific recommendations of what a good temperature would be. Not too hot, not too cold for all the various crops that you'd be producing. Also, good light because whether due to natural light conditions being too low or for whatever reason, your plastic is getting cloudy or any reason, really. If your plants don't have enough light, they're going to be getting leggy and so taking that into consideration is important.

In fact, that became really apparent to me a few years back because we inherited some equipment that was seized from a marijuana grow operation, and it was going to be destroyed as this part of the law enforcement course of action. We were offered some grow lights, and we had never used them before, and we were like, "Well, they're just going to be destroyed anyway. We'll take them," and so we put some grow lights on some of our plants, but we didn't have enough for all of our plants that we were propagating transplants. Then the ones that had the grow lights were the stockiest, cleanest, best-looking transplants I've ever seen and so that really ... That's one of those things that going outside of our known course of action reinforce something that we knew anyway that we should either ... Not so much that we should be using lights but that if we could get the plants as much light as possible that they would be better. Yeah, so the plants that were getting supplemental light were beautiful.

Those would be my basic suggestions for growing good transplant. It really just comes down to knowing what your optimal conditions should be and



figuring out how to implement them. That's the tricky thing. It's figuring out how to implement them because it's easier said than done. You can write it down in the book, say, "Oh yeah, the temperature should be like this and as much light as possible," where implementing that may mean a real system changes on your farm. It may mean changing the plastic that's 60 years old on a greenhouse, buying a new heater, getting base heat, building a germinator or something like that. Those are the kinds of changes that are very possible for growers, but it also does take some doing and possibly some investment of money to make it happen.

Chris Blanchard: With that word, we're going to turn to our lightning round. We're going to get a quick word from a sponsor and then we'll be right back.

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All right, and we're back with the lightning round, so Andrew Mefferd, what's your ... Normally we'd ask what's your favorite tool on the farm, but I'm going to ask you what's your favorite tool in the greenhouse?

Andrew Mefferd: Oh. I like these little handheld pruners from a Japanese company called Saboten. S-A-B-O-T-E-N, and they're available from a few different retailers. In fact, I had written an article a few years back in Growing for Market about hoophouse tools, and these are one of those things, they're just so well-designed. First of all, for people who aren't familiar, they fit in the palm of your hand because a lot of times I find myself doing cluster pruning or other leaf pruning or things that's really tight in that the plants have almost, feel like I'm doing Bonsai sometimes. My wife tells me that it's too much like orchard work which I guess, I like going in there and pruning and trellising. When I've gone through the whole greenhouse, it feels like I've set things right.

I like these pruners because they're so compact that you can get them in anywhere small, and they sit on your ring finger so you can flip them out of the way and wear them like a ring when you're using your hands and then flip them back into position. They have a safety that's operated by your thumb, so they're true one-handed operation. Just open them up, make a cut you need, then put the safety back on your thumb, flip it back around, you're ready to



work with your hands again.

Chris Blanchard: I'm looking online, and I think what you're talking about is these, it's a Saboten harvest scissors, it's a model 1318?

Andrew Mefferd: Yeah. Sure, Chris. Back in August of 2013, I wrote an article for Growing for Market about my favorite tools for the hoophouse and so that one that I particularly like is the Saboten compact harvest scissors model 1318. Last time I checked, they were carrying at John, also at Purple Mountain Tools, Purpletools.net and so I will make that article public. As you may know, most of our articles in the archives, the archive is one of the features of our subscription, so it's not normally available to the public, but I will make the article that I wrote in August of 2013 available so people can see my thoughts in greater depth there. You could go to www.growingformarket.com and you could put in the search box hoophouse tools, and that should bring the article up.

Actually, while we're on the subject of the magazine, I did make a promo code for your listener, Chris, so they can get 20% off of any subscription right now using the code podcast, just P-O-D-C-A-S-T. Is not case-sensitive. If you type it in the website, that should give you 20% off the subscription of your choice. It's open to new and existing subscribers. Unfortunately, we can't apply it retroactively, but if you are an existing subscriber and you want to take advantage of it, if you do via a renewal subscription at the discounted rate, it'll just tack it onto the end of your current subscription. That's available to anybody who listens to the podcast and wants to take advantage of that.

Chris Blanchard: Awesome. Thank you, and we'll have that link in the show notes as well as the reminder about that code. We'll do a link directly to that article as well. These Saboten harvest scissors, these are really interesting. I know you said, the way you describe them, you said they got a little loop for your thumb and you kind of switch them out of the way, but they're kind of a crazy looking tool.

Andrew Mefferd: Yeah. They're an example of really nice design. It's clear that they designed it and got people to use them, I think, and get feedback. They really work well for very specific purpose, all those little cuts, and they're just very compact and ergonomic and don't take up much space. They're fun to use.

Chris Blanchard: I really like that idea that you don't have to put them down. I that's such an important element for a tool, and I remember reading about that in Eliot Coleman's first book, The Organic Grower, and being, "Oh yeah, what a great idea?" A lot of times, it's really not possible to not put your tool down or not put it back in the sheath, but it's really clear that these are designed so you could do several things with your hands with this tool still on your thumb and then be able to come right back and do some snipping. That's really, I want some for my garden just because they're so neat.

Andrew Mefferd: Yeah. That's one of the principles of greenhouse growing right there is just



being as efficient as possible. If you can do something without putting it down, that's better than having to put it down every time. A lot of the greenhouse things that I'm talking about, you're doing over and over again. You're pruning however many plants are in your greenhouse, you're doing it that many times, so getting each pruning down to its minimum amount of time, even though I actually like doing that stuff, I don't want to spend any more time on it than I have to. That kind of stuff, just both having efficient tools and just doing the job in the most efficient way. It really adds up when you multiply hundreds or potentially thousands of times.

Chris Blanchard: We know that tomatoes are your favorite crop to grow, and you've already had a chance to talk about those a little bit. What's your second favorite crop to grow?

Andrew Mefferd: I also really enjoy cucumbers. Although part of that might be from ... They have a lot of similarities to the way that tomatoes grow. That's one of my points of the book is that if you learn these vining fruiting crops systems which a lot of people are probably going to think of it tomato system. That's fine to think of them that way. The skills that you need to grow all of these vining and fruiting crops, they are all very similar and so if you know how to grow a tomato in even trellis in the field or even better trellis in protected culture, you can transfer a lot of those skills over to another crop. You can take your tomato skills and apply them to peppers or cucumbers or eggplant which I think is a great opportunity just because eggplant is cultivated in protected culture so much less than all these other crops that I think there's a lot of ...

That's a crop that people are not extending the seasonal so much and so smaller growers can diversify their offering, so they have a nice mix of stuff on a farmers market stand or the CSA stand by throwing some eggplant even into a tomato greenhouse and into tomato and cucumber greenhouse. I'd say one of the other things that, if you're going to make me pick a second favorite crop, it might be salad mix. One thing that really changed the game for me on salad mix was the one cut varieties which if people don't know what I'm talking about, they're a range of salad mix that has been bred to be produced from heads.

In fact, there are several companies that are creating these, and they're known variously as Salanova, Easy Leaf, there might be a multi-cut out there. What it is is it's the head of lettuce that's designed to be broken down into salad mix because what it is, even though the lettuce is a more or less full-sized head, all the leaves are exactly the same size. They're all attached at one point and so what you can either is harvest them, you can cut a little higher in the field and have all the leaves just fall off, more like when you're cutting baby leaves. One thing that I really like about them is that you can cut them as heads and to take them back to a processing area and quickly process them into salad mixes at that point.

One of the reasons is because I never liked bending over to harvest baby



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leaves and so we heard about these a few years back, and we started using them. After we tried them, we changed all of our salad mix production on my farm of lettuce. We switched completely from baby leaf lettuce over to these one cut type lettuces. Part of it is because we were already making a lot of transplants, and that was a way for us to get more out of our protected culture for the leafy crops. You were asking how to get the most out of the leafies, and I would say that these are one way because you have to go to the trouble of making a transplant. Although, I guess you could direct seed them, too.

One of the ideas is that with protected culture, you really only have a limited amount of space. It's very precious real estate here whether it's a greenhouse or hoophouse, it's expensive to make that space and so one of our ways to get more leafies out of our protected space was to grow the ... We use the Salanova, but there are other types that are also really nice out there. What we could do is you get a much higher yield using the one-cut lettuces because you transplant it out there, and in about the number of days where you would have baby leaves, if you were direct seeding, you have a full head of lettuce. The yield is much higher, and the other thing we noticed is that the places where we are selling our salad mix, people were just complimenting us and telling us that we had the best salad mix. For one thing, you get a lot more crunch because ...

What it is is it's a mature head of lettuce with these tiny little leaves on it, so the crunch is much better because if you think about it, so baby leaves are kind of flimsy and floppy. They taste great, but they don't have much crunch whereas when you're harvesting the mature heads, they have a better crunch and they also have better shelf life for two reasons.

For one thing, because mature lettuce leaves have just better shelf life than baby leaf. That's just a fact of the matter, and the other thing is that when we were doing baby leaf salad production, we were trying to get multiple cuts because it doesn't really pencil out to plant the seeds and harvest them only once for baby leaf and then till them in for another round so we were trying to get two or three cuts out of our baby leaf. Inevitably what happens, even if you try to cut up above the old leaf, inevitably, you're going to cut some of the ragged tips from the first of the second cut, and those things are what rots first. There's just no way to get them all out of there.

That's what we realized is that even if the leaves that we meant to cut were not breaking down and had a good shelf life, what was dragging the whole bag down is that we had these little bits from the previous cuts. With the long cut type lettuces, you're just cutting the head once. You don't have ragged edges that you're cutting from previous cuttings. We also saw the shelf life of our bagged lettuces go up a lot. I'd say number two would be the one-cut lettuces just because that's something that really transformed our salad mix game when those were implemented. Like I said, over the course of just a year or two, they work so much better, at least for our system.



I know some people are already set up and really tooled in for growing baby leaf, so I'm not saying everybody's going to do this, but for a small farm like ours where we were just able to turn those heads over so quickly. As soon as we had cut a bed of one-cut lettuces, we would go in with transplants for the next round. It really helped us to get more production of a high-quality crop out of the same area as before.

Chris Blanchard: Awesome. Finally, Andrew, if you could go back in time and tell your beginning farmer self one thing, what would it be?

Andrew Mefferd: I would say to really pencil out the cost and things. That's really boring advice in a way because it's probably the kind of thing that people hear a lot, and also because there's a lot of talk these days about determining your return on investment and all that kind of stuff, but I think that was not as prevalent back in the day. Not even that long ago, it's 15 years ago or so about when I was first really starting out thinking about actually farming as a career. People were not talking about the numbers so much and so I feel like a lot of our early decisions were just made on gut instinct. "Well, we could buy this thing. We could probably pay for it. This is probably a good decision."

Of all people, I don't need to tell you, Chris. I know you know all about that stuff. That's not a good way to make the decision, so that's one trend that I feel like I've seen it growing for market which I talked to some people about is that I think you go farther back in the archives, for example. If you looked at what was being talked about at the very beginning of Growing for Market, I think it was more about just the raw basics of growing. Fertility, variety, equipment and stuff like that, and I think that as the direct market farming has matured, I'm still trying to have a lot of stuff about the nuts and bolts of growing, but also have a lot about marketing.

I realized it's one thing to grow it, and I feel like there's lots of good information out there about growing, and I hope there continues to be more, but then, okay, so you've grown it. You need to become a savvy marketer. You need to figure out how to ... You could grow the greatest stuff, but if you're taking it to the wrong people or people don't want to buy it, you're not going to stay in business, so there's the marketing and there's the business aspect. It's not exciting in a way, it doesn't sound exciting, but it's so important to be business-like even though you probably didn't get into farming for spreadsheets and stuff like that. You don't have to use spreadsheets, but it's important to find out what a financially sound decision is because I think we definitely wasted a lot of money on some bad decisions over the years. We weren't strategic and so we made decisions based on our guts, and sometimes we were wrong.

A lot of times, there were things that if we knew how to look at them more like business people that it would have been pretty easy for us to make a better decision, so I'd say ... In fact, there's some great books like Richard



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Wiswall's The Organic Farmer's Business Handbook, and a new one that just came out called The Farmer's Office by Julia Shank that particularly ... Julia's book comes to mind because it's new, but both of those books are filled with great ideas for farmers who are trying to be good business people and particularly don't want to spend a lot of time on the business. It's really what you need to know and not a bunch of what you don't. That would be my advice for myself 10 years back in time is spend a little more time on the business side of things.

Chris Blanchard: Andrew, thank you so much for being part of the Farmer to Farmer podcast today.

Andrew Mefferd: Thank you, Chris. It's been a pleasure. Thanks so much for having me on.

Chris Blanchard: All right, so wrapping things up. I'll say it again that this is episode 109 of the Farmer to Farmer podcast. You can find the notes for this show at Farmertofarmerpodcast.com by looking on the episodes page or just searching for Mefferd. That's M-E-F-F-E-R-D.

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