

Practical Advice from Successful Farmers - Tomatoes Q&A

Host – Angela Brattin, Brattin Farms

Farmers –

Andre Gradinaru, Gardener's Orchard

Liz Graznak, Happy Hollow Farm

Shon Bishop, Bishop Gardens

Angela - Andre Gradinaru with Gardener's Orchards, joins us for a live q & a. We also have Liz Graznak with Happy Hollow Farm in central Missouri. Shon Bishop with Bishop Gardens will be joining us shortly for this Q & A following our presentation of Practical Advice from Successful Farmers focusing on tomatoes.

Angela – Is there a best soil temperature that tells us when to add mulch. The questioner leaves her mulch off early to let the soil warm, but would like to know when to add mulch.

Andre - Soil temperatures can be touchy subject, especially when you're planting in high tunnels or greenhouses in early spring. In one of the first greenhouses we ever built on the farm, we did add radiant heat in the soil. In my mind at the time, I thought it would make a difference. So we went ahead to put it in. But then we moved our early tomatoes to another tunnel. We like to plant tomatoes in February into early March, and that current tunnel doesn't have any radiant heat, so we don't heat the soil at all and the tomatoes don't seem to mind. They still grow perfectly fine.

So there is a critical soil temperature. I just don't know what that is. Obviously it's above freezing. The air temperature inside the tunnel or greenhouse on tomatoes, I know that

you want to keep it above 42 degrees. If an open blossom does come in contact with 42 degrees, that bloom will be delayed at least a week when it comes to harvest.

I learned that the hard way when we were started heating our tunnels. When I first started, we were heating with wood and I wasn't able to keep a consistent temperature the entirety of the night so I was having issues with ripeness and harvesting of our fruit. It would just stay green on the plants forever and it would never start ripening. Forty-two degrees is a minimum. We like to keep it at about 55 in our tunnels now, but on soil temperature. I don't have an answer. We do heat with propane now, and we use black plastic mulch so we're able to get enough soil temperature in the last of February to early March without having to heat the soil at all to get great tomato production and get the tomato plants growing.

Angela - I think they were also asking about the cooling aspects keeping the soil cool. Is there a point when you add mulch later in the season?

Andre - we do not add more mulch. Whenever our plants get really big and bushy, of course we're growing the determinate varieties so the plant's going to be two and a half to three foot wide. so we're getting enough shade from the plant itself to shade around the root system. But, yes, adding regular mulch later in the season will cool down your soil.

Angela - Liz, I'm going to pick your brain for a minute. Is there a soil temperature you look for? Do you probe the soil for temperature to determine mulch application?

Liz - No. I put mulch in my pathways, just like Dre does. And I'm planting on landscape fabric, which is black, pretty much like what Dre is doing. I'm mulching my pathways on

top of the landscape fabric. I put the mulch down as soon as we put the landscape fabric down, mostly to help keep the weeds down. The landscape fabric or plastic in your tunnel is typically black

so it's helping that soil heat up. And in the summer I put shade cloth on my tunnels to help the tunnels stay cooler so I don't have blossoms drop in the middle of the summer when the temperatures are in the 90s or 100s. The shade cloth is helping to cool the tunnels and the tomato plants in the summertime.

Angela - Andre, you mentioned that you grow only determinate varieties. Can you give us a rundown on the difference between determinate and indeterminate and why you prefer the determinate?

Andre - So the difference is that the indeterminate tomato plant is going to grow the entirety of the season. The plant is made genetically to keep on shooting out blooms and shooting out growth. If you're warming up your greenhouse 12 months out of the year, your tomato plant will live for 12 months.

The determinate tomatoes are meant to grow to a certain size. Then whenever the plant gets to a certain size, it sets on all its fruit. After the fruit matures, the plant just stops growing. That's just how they are genetically. The reason why we choose to grow only determinate tomato plants here on our farm is that it takes a lot less input and labor to grow a beautiful crop of tomatoes.

Tomatoes aren't our only crop on the farm. We have a Tulip Spring Festival. Then we are ready for strawberry season. And, of course, during that same springtime period, we're also spraying our apple trees for fire blight.

So there's a lot going on in the spring months for us on our farm. And if I focus all my energy on one crop, like tomatoes in the greenhouses, then that takes away from all the other stuff. So that's why we like to grow tomatoes that are very easy to manage. I make sure they've got plenty of water. We feed in the fertilizer once a week. We stake them once a week. And other than watching out for disease or bugs, there's not much input into growing the crop versus indeterminate which you're always having to pull off the suckers, leaning, lowering. There's a lot more input going into the indeterminates vs. determinates.

Indeterminates do perform, pound wise per plant, a lot better in an eight-month period. They produce a lot more if you're able to keep them producing that long. But with the determinate you just plant them, they grow to beautiful size, usually 3 to 4 ft tall. They produce all your tomatoes, you harvest them and then they're done.

It's a super easy process. It works great in our system with all the other berries and crops that we grow on the farms. That's the main reason. And I personally think there's no better tomato, red round tomato, than Red Deuce. So that's why we grow them.

But I've got a good friend in Saint Louis trying Red Deuce tomatoes and treating them like indeterminates. He is pruning them. I was in his greenhouse a couple weeks ago and that tomato plant that's bred to be determinate was already six to seven feet tall so I guess if you do experiment with growing practices, you could get a determinate tomato plant to grow much longer and put more energy in fruit.

But usually determinates are "bush style". Just a nice bushy plant you harvest and you're done. We do multiple plantings of tomatoes. We plant a high tunnel with tomatoes about every month. So we do one in February or March 1st and another April 1st. If we get the

time, we plant another high tunnel May 1st with tomatoes. So it gives us an entire summer of harvesting.

Angela - Liz, do you have a preference? Determinate versus indeterminate?

Liz - I grow almost 80% indeterminate. And I do one a small planting of determinants outside June 1st for a late season, just big, quick, all at once ready in late summer/early fall harvest. But, you know, I'm shooting for a different customer. I'm growing almost entirely 100% heirloom varieties. And, you know, Red Deuce is an awesome red hybrid slicing tomato. But that's not the majority of what my customer is asking for. Most of my customers are asking for heirloom varieties. And so I'm planting grafted heirloom tomatoes that are indeterminate in my tunnels.

Andre - Liz, are you getting your own tomato plants or are you having someone else grow them?

Liz - I've got somebody doing it for me. You have to have a greenhouse with the set up to be able to do it and do it well, and I'm not set up for that.

Andre - So for the first time this year, Shon Bishop actually gave me three trays of grafted plants. He's using Max as the root stock and Red Deuce as the scion. I've always wanted to try to grow grafted tomatoes, but I'm like you, I don't have a set up to do it. Instead of trying and failing miserably, I've just never tried. So I'm pretty excited to see how the yield on grafted Red Deuce does in our high tunnels this year and Carolina Gold.

Liz - Who did the grafting?

Andre - Shon Bishop did.

Angela – And with that introduction, go ahead Shon!

Shon - Thank you. We've partnered with the Nichols-Richardson Foundation which wrote a Missouri Department of AG specialty crops grant to examine whether a tomato grafting business would be a profitable enterprise to add to a small, diversified specialty crops farm, if you could make money selling grafted plants to commercial producers.

This is the second year of the grant. The first year, I killed thousands of plants. But once that learning curve was passed, we have been able to produce grafted tomatoes for commercial sale. Of course, I'm biased since we have a garden full of them, but Dre and Angela who are on this call both have tunnels with them this year so ask them how they look so far.

Liz - The thing is that once you have the plant and the plant's alive, my experience is the production is so much better. But you have to get the plant. And it's a very difficult getting the plant. Boy, you've got to be right on. And that's the hard part.

Angela - I can say, from my perspective, I got 49 plants from Shon and I have 49 amazing plants growing. I chose Geronimo for the scion. I've got good sized fruit coming along. And they're doing well. As part of this tomato project, there will be more videos coming. The first video is on the training page of webbcityfarmersmarket.com where Shon talks about the whole process of grafting tomatoes.

Liz - I would put in the plug that I personally feel like it could be a very good business for somebody because I am getting asked so often where people could buy grafted tomato

plants - there is demand out there. I mean, it seems like there's a demand. We just have to find somebody that can do it. Shon?

Angela - He's your guy. Okay, next question. Do you see any advantage of either hard pruning or a double leader system when you're pruning your tomato plants?

Andre - the only time I've ever seen double leader on tomatoes that was done right was on cherry tomatoes since they're a more vigorous plant and the plant is well suited to that. I've personally never tried a double leader on tomatoes since we don't grow indeterminates now.

I've grown indeterminates in the past. I've grown Big Denas in our tunnels before. That's what kind of drove me away from growing indeterminates. But I think Liz will have a better answer on that with the double leader on tomatoes and hard pruning on indeterminates. On determinates we don't do much. We just sucker the bottom 2 or 3 suckers and we're done.

Liz - I haven't tried double leaders. It seems like you either choose one system or the other. You either plant closer spacing and do a single leader, or you space your plants out and you do a double leader. And I don't know if it's half a dozen of one or six of the other really. I have not done double leaders.

I just plant close spacing and we prune them and take off the suckers a lot and boy, when you miss your seven-day window, you then are coming into a jungle. Which we just did on Sunday, actually. Either way, you're going to have lots of suckering and lots of clipping and maintenance of the plants.

But I'm also going to be harvesting tomatoes for a long time. I've got cherry tomatoes that we're harvesting now and I'll have big tomatoes that are ready in another couple of weeks and we'll be harvesting off of those plants until the first, second week of September, before we yank them out to plant something else. So it's a very long harvest window off of those plants.

Angela - So this is my first year planting grafted tomatoes. They are indeterminate. I only have one high tunnel and I have strawberries in there now. But through the winter, I lost some plants. So I went ahead and stuck these tomatoes in amongst my strawberries. It's a zoo in there, but it's working, and I had quite a bit of space in there. Normally when I plant tomatoes in my tunnel, it's crammed full of 200 plants, and this year I only have these 50 tomato plants in there.

So when I had a little room because some of the strawberries didn't make it, I really wanted the tomatoes to produce as much possible. I've got double leaders on these and so far they look very good. Both the leaders have thick stems on both sides. I actually have tomatoes forming on both of the leaders, not just the blooms. I'm going to keep data on everything for Shon, but, so far, it's working, but this is my first attempt at it.

Angela - Andre, do you grow field tomatoes also?

Andre - We used to grow field tomatoes back in the day. But we've completely stopped. All our tomatoes are now grown under plastic just because the shelf life after harvest on field tomatoes is little to none. You know, a high tunnel Red Deuce will stay in our cooler, 55 degrees, about a week and it's still sellable. I know, with heirlooms, Liz will tell you it's not quite that story, but, field tomatoes are just tough. If you get weather, you get rain, they split. You may have beautiful tomatoes right before harvest and you get a three-inch

rain, well, there they all go into the compost pile. So no field tomatoes here. All ours are under plastic.

Angela – Liz, did you say you do a few?

Liz – Yes, I've got some, they're on plastic outside and we pick them every day. If you don't pick them that often, then, yes, you're not going to have good storage on them.

Angela - Andre, we also had a question on your composting process. You mentioned that you compost all your plants. Can you walk us through that? Is there a process you use?

Andre - We just get the skid steer or the grappler and smash all the plants, take them to our compost and bury them. Then we wait until they decompose. I'm not a sophisticated composter, I just keep it simple, let it decompose and rotate it whenever you see it kind of squatting down a little bit.

I'm not a professional when it comes to compost. I'm too busy doing, in my mind, more important things. But don't get me wrong, composting is important.

Angela - Do you then add that compost back to your soil? How long do you let sit?

I let it sit and then whenever we get our loads of manure or turkey manure or whatever, I incorporate it all into one big pile. When it's all decomposed, I put it back in the soil in the high tunnels.

Angela – Andre, do you rotate crops or do you do a cover crop in your high tunnels?

Andre - that's the hardest part about incorporating another crop or cover crop, especially in the summer months with tomatoes, because in my opinion, there is no other crop that will perform financially as well as tomatoes. Tomatoes in a high tunnel is the cash crop. So we're always chasing that cash crop, we're always wanting to make the most possible.

So we've been planting tomatoes in our same soil for six years now. And good or bad, this is our situation. I can't just stop growing tomatoes in one of the tunnels. One thing I did try a couple years ago was when we cleaned out our tunnels in the fall, I did plant strawberries in September trying to get a strawberry crop in the ground, harvest them, and when that strawberry crop was over, we pulled out those plants and planted tomatoes. I did this in the middle of June so we did let the soil rest for a little bit. But I don't know that it made a difference. I probably will never try strawberries in the high tunnel again.

I had a big fail because I planted so many different varieties. We had such a big issue with spider mites that one year. If I do give it another go, I'm going to do one single variety of strawberry and stay on top of the spider mites. But when it comes to crop rotating with tomatoes, it's tough.

It's really hard. Especially for us, since we only sell our own crop and we do grow for profit. In the high tunnels, we only grow tomatoes, we don't grow any greens, we don't grow any lettuce for market or anything. So there isn't another crop that I've found, to rotate. We've just been growing on the same ground year after year.

I'm aware we're going to have some issues down the road. Thankfully we haven't yet, but there is going to be an issue down the road. I hope it doesn't happen soon, but that's why we like to cover crop really heavily in the winter months.

Annual rye grass grows at a really fast rate. And daikon radish adds a lot of green, organic matter in the soil as well as digs down deep. So I mix those two. You can do oats. There's all kinds of different cover crops you can plant. One year I planted a bunch of lettuce and radishes and stuff, thinking that we would be going to farmers market. We never went, so I let it go. I just tilled it under and that was my cover crop for the year.

Another thing folks are saying, well, you can do peppers. Peppers are in the same family as tomatoes, eggplants in the same family as tomatoes. So it's tough unless you're growing zucchini, squash and cucumbers, but I don't know if that's feasible. They do really good outside so it doesn't make sense to use high value space like high tunnels. So yes, I have no right answer. We're growing tomatoes, on tomatoes, on tomatoes every year. And for me, there is no plan on changing that. So I guess the moment we start having soil born issues we're going to start growing in bags or getting two gallon pots, filling a pot with potting soil and going that route.

Angela - Yes, there's ways around it. Liz, do you rotate your crops?

Liz - Certified organic rules require that you have a three-year rotation. So yes, my tomatoes are every fourth year in the same tunnel. But I have a LOT of high tunnels.

Angela - This question will be interesting for both of you. One being conventional, and one certified organic. What do you guys do to control the mighty spider mite?

Andre - I'll let Liz go first. Mine's simple. We just use conventional insecticides. I'm curious to hear what Liz does.

Liz - So, there's always some spider mites. My goal is to just not let them get so crazy out of hand. And to not let them get so crazy out of hand, we prune heavy and have very, very, very good airflow. All of my high tunnels that I'm growing tomatoes in have circulation fans.

We prune real heavy, and I use a pretty regular release of beneficials. It seems to do a pretty good job. We just pruned tomatoes on Sunday morning. And there's some spider mites. Not a lot. There's a few. And all of those lower leaves where the mites are, all got taken off. They're all out of the tunnel now. I'm sure there's still some in there on the plants and we are like, hard core, hard core. No clippings get left on the ground, below those plants. So it's really clean in the tunnel. And at some point the spider mites go away. So, it's really hard core maintenance, really a lot of airflow. And, keeping the plant foliage at a minimum.

There's a couple of approved organic insecticides that we can use, and they work somewhat. You know, they're not awesome. But they do help knock back the population. Entrust, Pyganic. Those are two main ones that I use, in rotation.

Andre - I've heard of Entrust. It's just really expensive. I've used Kanemite and it works really good. It knocks down all the nymphs and all the adults. And then Akramite is really good as well. But I was talking to my chemical guy about spider mites on strawberries, and I found this very interesting.

He was trying to sell me a product to spray, and I said I need it today. I can't wait three days for it to ship. And he's says get 10 pounds of sugar, just regular cane sugar, mix it in your mix tank in your sprayer and then you spray that on your strawberries. He said it suffocates the spider mites and it makes them disappear. And I was like, hey, why you're

trying to sell me a product? Why can't you just tell me this from the beginning? So when it comes to the conventional side of farming, everybody's trying to make money. They try to sell you a product.

I've never tried the sugar spray but if you guys want to try it, go for it.

A high tunnel is only a 15th of an acre if it's a 30 by 96. So whenever you are mixing your chemical rates, make sure you keep that in mind. You're not spraying an entire acre. Most labels show the amount of product per acre. So you've got to keep that in mind. Measure your square footage and calculate accordingly. But yeah, spider mites are ugly. If you don't stay on top of them, they will eat you alive. Your plants turn yellow and then you're done for.

Angela - When it comes to diseases, what tomato diseases are you seeing and how are you taking care of those?

Andre - So the only fungal disease I've seen on our plants has been Botrytis. And that's just because plants get so bushy and we don't have any rotating fans in our tunnels. We probably should. We just let the sides down. Botrytis is the only thing I've actually seen. Of course, you run into blossom end rot every once in a while, but it's not terrible.

A lot of these diseases can be avoided just by airflow. Liz was saying that, prune your hard plants down really hard, make sure you've got plenty of airflow through there and you shouldn't see it much. But I don't want to speak for her.

Liz – We definitely get diseases and that's one of the main reasons that I switched to growing grafted tomato plants. Better production and less disease pressure. But I do get

diseases in my tunnels. By the time September rolls around and the diseases are starting to really rear their head, it's time for the plants to come out anyway, because it's time for me to be planting a fall crop in there that's going to be overwintered.

So getting to the point in your experience to be able to say, enough's enough. They're gone, even though they still have fruit on them. You have to be able to do that because you that you can make money off of the next crop that you're going to be putting in that tunnel.

We get different fungal things. But I have ten circulation fans in each of my 200-foot long high tunnels. So there's massive airflow in those tunnels. And I don't have super extra tall side walls. I just have regular six-foot tall side walls, but the air is moving in those tunnels. And that has helped a lot with reducing fungal pressure and any kind of disease.

Andre - If someone sees a bad fungal disease, just spray copper. It knocks it out of the park and you should be fine.

Liz - And there's approved organic copper also. And I've sprayed it once, I'm going to say, in the last six or so years. But by managing your crop really well you can avoid spraying copper which isn't great. It does work, but it's not great.

Angela - I don't necessarily see a lot of disease problems in my tunnel until the end of the season, and by then I'm tired of the crop anyway and it doesn't take much for me to pull them out. But this year, being so wet down here, we may see a different story. So we'll keep an eye out.

Angela - Do either of you have any more tips for a new producer or for a producer wanting to up their tomato game? What would you advise them?

Andre – I'd just say go for it. The truth is, you don't know what you don't know until the problem occurs. So just go for it full ahead.

Liz - I will caution folks that knowing your market will really help. I personally do not think that I can make back the money that it would cost me to heat a high tunnel in order to grow an early crop of tomatoes because I can sell the other winter crops that are in that tunnel for just as much money, if not more money per square foot.

But that's because the market that I'm selling to, I think, is quite different than the market that Andre is selling to. So knowing where you're going to sell the crop that you're growing is really, really important. Because if you don't have a good market that can pay you top dollar for whatever you're selling from your tunnel, then you'll lose a bundle.

So I'm not heating any tunnels to have an early crop of tomatoes. But we're going to have really early tomatoes this year just by planting early, row cover, black fabric, which helps keep the soil warmer. Lots of row cover. On and off, on and off. Luckily, we had a really warm spring this year. But all those components don't always come together.

Andre - I would say on marketing as well, that if you don't have a market for tomatoes, don't even plant them. That's step one. Before you build a high tunnel, before you build all that, make sure you know where to go with those tomatoes, because if not, you're growing a very expensive compost pile.

I do some consulting work and there was a guy calling me out of South Carolina to say “I'm getting ready to put three high tunnels up for tomatoes”. I'm like, okay, where is your closest metropolis? Where are you going sell that product? Don't get me wrong. Go for it. I mean, plant three high tunnels of tomatoes, but you've got to have a market.

We've been working to build our customer base for the last ten years. Someone in Year One cannot expect to grow and sell as many tomatoes as I do. So marketing is top priority. Before you even plant a tomato in the ground, have a home for that. And so Liz said it perfectly, that's a must.