

## **Practical Advice from Successful Farmers - Berry Establishment Q & A**

**Hosts –**

**Angela Brattin, Brattin Farms**

**Patrick Byers, University of Missouri Extension**

Angela - Hi, my name is Angela Brattin and I am a farmer here in Southwest Missouri. I have a small market garden and I've been involved with the Fruit Education Site since almost the beginning of the program and it's been such a great project and I've learned so much from it.

I have a high tunnel that is the same size as Lykou's, 30 by 72, and normally I grow tomatoes in there during the summer and then over the winter I will grow my cool season crops like lettuce and cabbage, broccoli, Brussels sprouts, and brassicas. With this project, I saw the success Lykou was having growing the strawberries in the high tunnel. And so I wanted to do that on my farm. I've put together a short video on lessons learned during my first season growing strawberries undercover. That video is posted on <http://www.webbcityfarmersmarket.com/training.html>. I wanted to share the things that I learned, practical things that worked well and things I would do different.

Patrick - The first question - Will I need to plant two different varieties of blueberries for pollination?

Patrick - Blueberries, high bush blueberries, which are the types that we grow here in Missouri are self fertile, which means that your whole planting can be one particular cultivar. But if your goal is to maximize production, it is beneficial to have more than one cultivar present because there is some degree of yield increase by providing cross pollination. It's not absolutely necessary, but there is a benefit to having more than one cultivar in a planting. Of course, there are other reasons that you might want to consider more than one cultivar, perhaps to spread your season out to give you a longer harvest period. But, yes, consider more than one cultivar.

The other thing that's important is to provide for pollination. And the best pollinators of high bush blueberries are bumblebees. So do everything you can to foster your native populations of bumblebees. There's also benefit to bringing honeybee colonies into a blueberry planting at flower. And you can also purchase bumblebee colonies and bring those into blueberry plantings as well.

So again, to maximize yield under Missouri conditions, plant more than one cultivar and provide for pollination.

Patrick – Second question - Why were the strawberries only grown for one season?

Patrick - this particular production strategy is called annual production and the entire set up is geared towards a single crop. Now, at least in theory, you could maintain the strawberries for additional production cycles, but experience has shown that after the first harvest season, the plants that remain after harvest begin to divide and you end up with lots of crowns where that original plant was and the result of that division of crowns is a plant that will produce fewer and smaller berries the following year.

The planting is also more likely to have disease issues because they are so dense. Experience has shown, and this has been demonstrated through both research and

farmer experience, that the second and third season crops on these systems are just not profitable. So the whole system is designed for a single cycle of production and then new plants are planted in the following year.

Patrick – Next question - Other than Triple Crown, what are other good blackberry cultivars for Missouri?

Patrick - There is a nice suite of cultivars available. If someone had asked that question 25 or 30 years ago, I would have to say, well, there's some thornless ones that are OK, but you probably should be thinking about thorny blackberries. But thankfully, today we have a fabulous suite of thornless cultivars available. They can give you good coverage of at least five to six weeks of harvest season. And here in Missouri, we tend to lean on the cultivars developed at the University of Arkansas. So if you see a cultivar that has a name in honor of one of our indigenous tribes, that's a pretty good sign that it's from Arkansas.

Here in Missouri, Natchez is an early season cultivar that has performed very well. It has large berries. Moving a little bit later in the season we have cultivars such as Osage and Ouachita that are both tried and true cultivars. Two new cultivars available, Ponca and Caddo, are being trialed in Missouri. The jury is still out, but they too look promising. Moving into harvest season in July, we look towards Triple Crown and, perhaps, other cultivars. But the ones that I just mentioned, Natchez, Osage, Ouachita and Triple Crown, are good ones to consider from the standpoint of blackberry production. They're all thornless, they have good quality berries. They vary in size from very large berries in the case of Natchez to medium sized berries in the case of Triple Crown, but these would be the ones to consider for blackberry plantings here in Missouri.

Patrick - OK, next question - How long does it take a blueberry plant to become productive?

A good type of planting stock to use for establishing a blueberry planting is 2 year-old plants. By planting 2-year old plants, which are typically about 18 inches to two feet tall, you'll put yourself one year closer to production versus a one-year plant.

So the guideline to use for when to start picking blueberries off a plant is to allow the plant to grow to be about 3 foot tall before you set a crop. This typically means removing blossoms or berries the first growing season after you plant the plants, and perhaps the second as well. Your goal is to grow a bush first and then begin to grow berries.

In general, by the time the plant has been in the ground two years in your planting, it should be large enough to produce berries and full production will come around year six or year seven.

Patrick - OK, next question - How do you market elderberries?

From the standpoint of a large scale planting, elderberries are going to be marketed to a processor because elderberries are a processing berry.

I guess a person could eat a handful of elderberries and enjoy it, but quite frankly, they don't taste very good as a fresh berry, but they do make fabulous processed products.

On a small scale, there is a market out there for home elderberry processors, people making jelly or jam or perhaps a tincture or a concentrate or some sort of juice

product. So that is a market for the berries, perhaps at a farmers market or to invite people to the farm to harvest the elderberries.

A new market that we're very excited about is the flower market because the flowers are a marketable part of the elderberry as well. In the case of flowers, they're used to flavor beverages. They can also be dried to make fabulous teas and those sorts of things. So there are a number of marketing opportunities for elderberries.

Patrick - OK, here's a question - If you were to only grow strawberries for one year, would you pick off the first round of blossoms or leave them alone?

Patrick - In the case of annual strawberries, there is not a need to pick off the blossoms. Occasionally they will throw some blossoms during the fall and those could be picked off and removed, but once you move into the spring season, there's no need to pick off the blossoms as is the case with matted row traditional strawberries. But with annual strawberries, again, there's no need to remove blossoms.

Angela - Talking about the blossoms being picked off, because for the most part our winter was pretty mild last year I think, I was seeing blossoms in November, December and I did pick those off. When I uncovered my berries at the end of February, 1st of March, I had a lot of blossoms.

Patrick - We have a question, Angela, for you. What was your yield on your strawberries in the tunnel?

Angela - As of today, I'm still picking. I started picking the last week of March. I started selling berries the first week of April and I picked again today. So far I have 920 lbs out of my 30 by 72 high tunnel. So I've been pleased.

I had 6 rows in my high tunnel. I placed close to 800 plants in there. They were tight and I lost a few, I think due to irrigation issues during the winter. But I've still been very pleased with my yield.

Patrick - OK, the next question - If strawberries are planted outside rather than undercover, should they be planted in the fall as well?

Patrick - Yes, if the goal is to grow strawberries in the annual production system outside, they too are planted in the fall. They are planted in early September in Missouri. So the discussion in the video would be the very similar for strawberries planted outdoors.

Angela - And those outdoor berries should be covered up to protect them from winter damage.

Patrick - Another question - How do you know when to uncover your blackberries?

Patrick - So in the case of blackberries, typically farmers are placing the row covers over the RCA trellis when it's in the horizontal or dropped position sometime in December when the plants are fully dormant, but before really cold weather arrives and then the covers stay in place till, typically, sometime in late February. You want to take a peek underneath and when you start to see bud development, it's time to uncover the blackberries.

Keep the row covers handy because if freezing temperatures are predicted once the plants begin to grow, the row covers can be placed back over the planting to give some degree of protection from the cold weather.

Patrick - OK, next question. Are there any recommendations on how to prepare a raised bed for strawberries? Do I need to put wire in the bottom?

Patrick - Generally in a situation like we saw in the video in a high tunnel or in an open field, there's no wire placed in the bottom. And the raised beds are typically about 36 to 48 inches across, depending upon the size of your bed maker. They're anywhere from about four to six inches in height.

Then the irrigation line is placed in the bed and the plastic film is placed over the bed and irrigation line. The nice thing about using a bed shaper is that it buries the edges and does all of these site prep practices in one pass.

Angela - I have something to add on the bed shaping in the high tunnel for strawberries. The way my high tunnel is set up, I have a 10-foot door on one end and the other end is just closed. So I don't have a big enough door to drive through with a tractor.

I have a tiller with a rotary plow attachment and I used that to throw the soil to the center to make my raised beds. It was a trial and error type of deal, but it worked marvelously. They were tall enough that I just had to flatten out the top. I was able to make them 36 inches wide and that allowed for two rows of strawberries down each raised bed.

Patrick - OK, another question, are strawberry runners worth growing for next season?

Patrick - That's actually an excellent question. The situation with most of the plug plants that are produced for annual plantings here in Missouri is that the runners are grown in Canada and they're grown in fields that are isolated from other strawberry fields and fields that are established from virus-tested mother plants. The idea being that the runners should be as free from disease as possible.

There have been some issues in the past, but in general the runners coming from Canada are pretty good quality. Then they are grown into plug plants, hopefully by nurseries that are well versed in producing a good quality plug.

Yes, you can produce plug plants yourself from your own runners, but there's always a risk that the mother plants that you collected the runners from might have a disease issue that would then carry over into the next season's crop. So in general, plug plants are not produced from the runners in your planting for plants for next season. There's just too much of a risk there.

Angela – Patrick, do you want to talk about pest control and watching for pests in the high tunnel with strawberries.

Patrick - We had some issues with pests in the high tunnel at the Education Site. There's sometimes this misperception that the high tunnel is an ideal growing environment. And yes, it does offer some advantages for strawberries, but there are some challenges as well.

First of all, obviously there is the need to manage irrigation closely. The primary pests that we had in the high tunnel with the strawberries were spider mites and you've got to be vigilant. It really surprised me that we had issues so early in the season. We actually saw spider mite damage in February. And so it's important to monitor the plants closely for spider mites and then address any issues.

In our experience in the tunnel, it started off with hot spots. And if you caught those early, you could treat those areas and not have to treat the entire tunnel. Unfortunately our guard was down and we ended up having to apply a tunnel-wide treatment to get the spider mites under control.

So keep an eye out for pests. There's the possibility of other issues as well that are specific to particular crops. And it's important to get an understanding of what those pests are.

For more information on that, please feel free to reach out to University of Missouri Extension and Lincoln University Cooperative Extension for resources and assistance. And if you ever need help identifying a problem, we have a diagnostic clinic that's available as well.

Patrick – here's a question. Would it be OK to use town water that is chlorinated?

Patrick - In general, the berry crops are not as sensitive to chlorinated water as other specialty crops like certain vegetables. Also, as you use chlorinated water in a system such as a drip system, the chlorine does tend to volatilize and move away from the plants. We have not seen any serious issues using municipal or other water that has been treated with chlorine.

Patrick - another question - Would spider mites cause rotten strawberries?

Patrick – In general, no, the damage from spider mites is primarily to the foliage and then to the calyxes of the strawberry fruit. Then what you see is a yellowing or a speckling of the leaves.

In a serious infestation such as we had at the Education Site, you would see webbing on the leaves as well. But often times the first evidence that there's a problem is a slight yellowing of the leaves. And at that point, you want to take a close look at the undersides of the leaves, which is where the spider mites feed. I find that putting a piece of white paper under the leaf and then tapping the leaf will cause the spider mites to drop on the paper where they're much easier to see. You can also take your finger and kind of smear it across the spot you're investigating. If you see streaks that are yellow, orange or red, that's a pretty clear sign that you have spider mites.

Now, what would cause rotten strawberries? That's primarily a disease issue. And in particular, the disease botrytis can cause rotten strawberries. There are other diseases as well. If you have any questions about diseases causing problems in your strawberries, please reach out and we can help you identify what that problem is.

Patrick - OK, so we have another question - Can the flowers for the first-year growth of elderberry still be picked and utilized or should they be removed for the first year to focus on rib growth?

Patrick - With elderberries, it's possible to pick a crop the second year and in fact sometimes you even get a few flowers on the plants that have grown from planted cuttings the first year. There's no need to remove those flowers. Elderberries are vigorous growers and they will establish and grow well even without removing flowers. You could certainly harvest flowers in the planting year or in the following year. But there's no need to remove those flowers.

Angela - I have a question. I had significant spider mites also and I was caught off guard even though I knew that we had history at the Education Site of having to deal

with spider mites, but I was caught with no miticide of any kind. So I had to source that. And by the time I had it, a week later, they were in the whole tunnel.

But my other pest that I had to deal with was slugs. Is there a good way to get rid of slugs because they were causing a lot of damage in my berries?

Patrick - Slugs will feed on foliage and on berries. They can really be damaging especially in the high tunnel setting where you have good environmental conditions for their survival. From the standpoint of management, there are molluscicides that target slugs. And those are certainly one way that you could deal with the issue. For organic growers, there is a powder that you can distribute around the plants. It's made of silica diatomaceous syrup. And that is helpful against slugs as well.

But the high tunnel environment, especially if you're perhaps applying a little bit too much water, can be very favorable to the development of slug problems. So stay vigilant and scout your plants.

Angela - My best way of taking care of it was I cleaned all the dead leaves and plant litter out from underneath the plants. I wore rubber gloves and made sure that all the plant debris was gone.

Patrick - Yes, slugs are always worse if there is debris for them to shelter under.

Angela - And I felt like in a high tunnel that was more significant because you don't have a lot of the wind blowing plant debris away. But I still had slugs even after I cleaned out. They weren't terrible, terrible, but they were more than what I wanted. I was throwing away big berries that I would like to have sold.

Patrick - We have another question - What fertilizers are recommended for organic growers?

Patrick - When you start to think about organic fertility management, it's definitely a process and frequently it starts with compost applications. As compost decomposes, it does release nutrients, especially nitrogen. Other nutrient sources for organic growers include manure based products such as pelletized poultry manure. There are fertilizers based upon alfalfa meal or alfalfa pellets that can be used. There are fertilizers based on chicken feather meal and also on a corn gluten meal.

However in the case of corn gluten meal, typically organic certifiers will only allow non-GMO corn gluten meal, which can be sometimes a challenge to source, and chickens that have been fed on non-GMO feeds from the standpoint of chicken feather meal. Other organic fertilizers, such as fish emulsion, bone meal, blood meal, these are options as well. And then there are some mined materials that can be used as nutrient sources, such as green sand for potassium and some of the naturally occurring phosphorus sources. So there's a range of organic fertilizers that are available for organic growers.

It's important to understand the needs of the crop and also to realize that with many organic fertilizers, they must undergo decomposition before the nutrients become available. So there's a bit of a time lag from when the materials is applied to when the nutrients are actually available for plants. If this is something you're interested in, please feel free to reach out. We can talk more about this.

Patrick - another question - Do you have to utilize nets to keep out birds of the fruits?

Patrick - Some of the berries, especially blueberries, are very attractive to birds and it's important to have a plan in place. Many berry farmers start by using scare tactics. Things such as scare eye balloons and kites, recorded bird distress calls, reflective Mylar tape. These are all options that have effectiveness against birds. It's also possible, as you note, to utilize nets. And nets work very well.

Typically the best approach is to support the nets on some sort of structure over the berry plants rather than draping them on the berry plant itself where the birds can still get at the berries. But that means you have to have a support system as well as the net. And then the nets themselves have to be put up and taken down during the harvest season. But, yes, nets work quite well. I would say in terms of bird damage, blueberries are probably impacted the most. Here in Missouri we have seen some bird damage on elderberries, but bird damage tends to be at a lower degree on blackberries and strawberries, but they too can be can be damaged by birds. Certainly blueberries will be a crop where you would expect to see bird damage.

I want to thank everyone for joining us tonight.

Please feel free to reach out in the future if you have any issues related to berry production.

For more information go to: <https://extension.missouri.edu/counties> to find the MU Extension Office nearest you.

For the Lincoln University Cooperative Extension staff member nearest you go to: <https://www.lincolnu.edu/cooperative-extension-and-research/cooperative-extension/faculty-and-staff.html>