February 2020

The Produce Pages

Serving the fruit and vegetable growers of Eastern New York

Leah Munsey and Orland Diaz of Lo Farm at Taliaferro's. Photo: L. Higgins

Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

Feature Farm Story

Farms in Transition: *Taliaferro Farms* becomes *Lo Farm at Taliaferro's* in 2020

Elizabeth Higgins, CCE ENYCHP

One of Ulster County's established CSA farm businesses, Taliaferro Farms in New Paltz, NY, is changing hands and will be farmed by Leah Munsey and Orlando Diaz as Lo Farm at Taliaferro's this year (https://www.thelofarm.com/). Leah and Orlando have leased the farm from Pete and Robin Taliaferro and will be operating a farm-card CSA, the farm market and at two farmers markets.

The couple met as AmeriCorps volunteers in Montana. While in Montana they began working on a small organic farm and fell in love with farming. Work opportunities took them back to the East Coast, and after several twists and turns they ultimately found themselves working for several years as managers for Golden Earthworm Organic Farm in Long Island which serves NYC farmers markets and CSAs. Their dream was to own their own farm in the Hudson Valley, where Orlando grew up. They thus began the long process of moving from farm management to farm ownership. At one point several years ago they reached out to Pete Taliaferro, who had a rental ad on the Hudson Valley Farmland Finder, about purchasing his farm but Pete was looking for a renter and they were looking to buy. They then attempted to purchase a different property in Columbia

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County, but ultimately that deal fell through. They looked at other properties and in 2019 worked for MX Morningstar farm in Columbia County. Max suggested that they contact Pete again – and this time the stars aligned, and they entered into a lease agreement with Pete and Robin to rent Taliaferro Farm. "The delays in finding land and starting our business, while frustrating at the time, probably have helped us in the long run" said Orlando. "We had the opportunity to work on many different farms and see different farming systems and management styles. We are also past the honeymoon phase of farming as we are both experienced farm managers, we have a good sense of how we want to farm, and we work well together."

In addition to using the Hudson Valley Farmland Finder (https://hudsonvalleyfarmlandfinder.org/) to find land, Leah and Orlando used a mini-grant program for technical assistance offered by American Farmland Trust to assist with the legal costs of developing a lease with Pete and Robin. "It was immensely helpful." Leah said. They also spoke very highly of the support that Pete and Robin have given them as they have launched their own business. "Pete organized a CSA sign-up day for us during his Thanksgiving share pick-up in 2019, which allowed us to meet his existing customers. They [his former CSA members] have also been immensely supportive of us. It is heartwarming feeling that people want you to succeed."

So what does the future hold for Lo Farm? Like Taliaferro Farm before them, they are committed to the CSA model and plan to continue to focus on creating a strong bond between their CSA members and the farm through opportunities on the farm that are only open to members, including U-Pick areas, and farm events. They are also planning to continue the farm market. Both Leah and Orlando also expressed a commitment to providing affordable food, particularly to economically disadvantaged communities.

Sweet Potatoes—2019 Variety Trial Results; Evaluating Growing Slips from Roots and Slip Size on Establishment and Yield

Charles Bornt, Ethan Grundberg, Natasha Field, and Nate Mengaziol, CCE ENYCHP

2019 Fresh Market Variety Trials: Because there is a growing interest from producers looking to grow sweet potatoes, we evaluated 11 varieties during the 2019 season. Evaluations were completed at Samascott Orchards in Kinderhook (mineral soil) and Morgiewicz Produce in Goshen, (muck soil). Each variety was planted into raised beds with plastic mulch (Samascotts used black mulch on 6.5' centers and Morgiewicz used white mulch on 6' centers). Each variety (where there were enough plants) was planted with both a single row 12" apart in the row and a double staggered row 12" in-row and 18" between rows. Each plot was 25' long for a total of either 25 or 50 plants depending on spacing. Unfortunately, because we had several different sources of slips, not all the slips were shipped/planted at the same time. Table 1 and 2 lists the planting dates for the 11 varieties and NY Covington (slips produced at Samascott Orchards from certified roots purchased from Jones Family Farm - more information on this below). Roots were graded for marketable size, culls (misshapes, too small etc.), mechanical damage (roots broken, skinned etc. by the harvesting process), rot and rodent damage. The size categories (Figure 1 & 2) included 'Jumbo' (roots weighing more than 32 ounces), 'Large' (14-32 ounces), 'Small' (4-14 ounces or 'Fingerling' (1-4 ounces). Each root was weighed and counted.

Figure 1: Different size categories used for grading sweet potato roots for these trials. Photo: N. Field

Figure 2: Final grading of 3 of the 11 varieties from the Samascott Orchards location with 1 row and 2 row configurations. Photo: N. Field

Results

Samascott Orchards site: Vines were removed by hand and roots lifted on October 15, 2019. B-14 (Beauregard) planted in the double staggered row resulted in the overall highest total marketable yield per acre with

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41,921 pounds followed closely by NY Covington double row (40,401 lbs per acre) and single row (39,182 lbs per acre) (Table 1). Roots in the 'Large' category that weigh between ¾ - 1 pound are generally the preferred roots sought after by consumers. At this site, the greatest yield of 'Large' roots was NY Covington single row at 16,200 lbs per acre followed by B-14(Beauregard) single row at 15,500 lbs (Figure 3). These treatments also produced some of the highest 'Small' roots with an average of 20,000 lbs per acre—but also had the largest average size of roots in this category. Even though the percentage of NY Covington 'Large' roots is lower than Orleans, NY Covington single or double row still produced 2x the marketable 'Large' weight as Orleans. If you are looking for 'Jumbo' roots for a sweet potato fry market or other type of processing, 445 produced nearly 7,000 lbs per acre or 40% of its total yield followed by B-14 (Beauregard) at 4,300 lbs (12%) or Averre at 3,000 lbs (15%). In fact, 445 produced a total of 26,262 lbs or 87% of its total marketable roots in the 'Large' (49%) or 'Jumbo' (38%) category.

Morgiewicz Produce site: Vines were removed by hand and roots lifted on October 4, 2019. Roots were then graded for marketable size, culls (misshapen, too small etc.), mechanical damage (broken roots, skinned etc. by the harvesting process), rot and rodent damage. NY Covington planted in the double staggered row resulted in the overall highest total marketable yield per acre with 43,488 pounds followed closely by Orleans 2 row (38,865 lbs per acre) and Burgundy 2 row (32,274 lbs per acre) (Table 2). Roots in the 'Large' category which weigh between ¾ - 1 pound are generally the preferred roots sought after by consumers. In this trial, the greatest percentage of "Large" roots was in NY Covington double row at 51% of the total marketable yield or 19,656 lbs (Figure 4). If you are looking for 'Jumbo' roots for a sweet potato fry market or other type of processing, the variety 445 produced 17,000 lbs per acre of Jumbo roots or 62% of its total yield followed by B-14 (Beauregard) at 9,700 lbs (43%) and Orleans at 7,500 lbs (42%).

Eating quality: Determining the eating quality of sweet potatoes or anything for that matter in my opinion is very subjective as people have many varying tastes. We took a very simplistic approach to this and oven roasted one sweet potato root per variety. Each variety is different from one another, some more so than others. In this trial, with our tasters, Covington in general was the best tasting followed by 445, Averre and B-14 (Beauregard). Murasaki, Burgundy and Bonita were ok. We did not care for Orleans, Bellevue and especially 14-31.

Table 1: Variety description, planting date, stand counts and yield information for Samascotts Orchard site.

Variety	Source	Skin/Flesh Colors	Planting Date	# of Rows	Stand Count	Total Marketable Yield (lbs)	Total Yield (lbs)
B-14 (Beauregard)	Louisiana State University	Red/orange	6/19	2	48	41,921	42,625
NY Covington	Slips grown in NY	Red/orange	6/12	2	50	40,401	41,791
NY Covington	Slips grown in NY	Red/orange	6/12	1	25	39,182	39,790
B-14 (Beauregard)	Louisiana State University	Red/orange	6/19	1	24	35,510	35,569
Averre	Jones Family Farms	Red/orange	6/7	2	48	27,332	29,028
Bonita	Jones Family Farms	White/white	6/7	2	37	23,370	24,698
Covington	Jones Family Farms	Red/orange	6/7	1	24	19,794	20,523
Averre	Jones Family Farms	Red/orange	6/7	1	18	19,526	20,293
Covington	Jones Family Farms	Red/orange	6/7	2	45	19,011	19,966
445	Louisiana State University	Red/orange	6/19	2	24	17,592	19,028
Bellevue	Jones Family Farms	Orange/orange	6/7	2	39	15,125	18,517
Bonita	Jones Family Farms	White/white	6/7	1	22	14,547	15,000
14-31	Louisiana State University	Purple/purple	6/19	1	24	13,735	16,947
Orleans	Jones Family Farms	Red/light orange	6/7	2	44	11,972	15,138
Orleans	Jones Family Farms	Red/light orange	6/7	1	25	10,988	15,866
NC-531	Jones Family Farms	Red/orange	6/7	2	41	10,523	12,877
Burgundy	Jones Family Farms	Dark red/dark orange	6/7	2	46	9,849	10,749
Murasaki	Jones Family Farms	Purple/white	6/13	1	25	8,723	9,878
Bellevue	Jones Family Farms	Orange/orange	6/7	1	11	6,323	6,474
Murasaki	Jones Family Farms	Purple/white	6/13	2	45	5,586	5,724
Burgundy	Jones Family Farms	Dark red/dark orange	6/7	1	19	5,511	8,438
NC-531	Jones Family Farms	Red/orange	6/7	1	11	2,726	2,982

Table 2: Variety description, planting date, and yield information for Morgiewicz Produce site:

Variety	Source	Skin/Flesh Colors	Planting Date	# of Rows	Total Marketable Yield (lbs/acre)	Total Yield (lbs/acre)
NY Covington #2	Slips grown in NY	Red/orange	6/14	2	43488	62992
Orleans	Jones Family Farms	Red/light orange	6/14	2	38865	53274
Burgundy	Jones Family Farms	Dark red/dark orange	6/14	2	32274	44831
Averre	Jones Family Farms	Red/orange	6/14	2	31882	50108
NY Covington #2	Slips grown in NY	Red/orange	6/14	1	28169	39626
445	Louisiana State University	Red/orange	6/24	1	27804	39232
B-14	Louisiana State University	Red/orange	6/24	1	27095	48839
NY Covington #6	Slips grown in NY	Red/orange	6/14	1	27089	35179
Bonita	Jones Family Farms	White/white	6/14	2	25282	40649
Bonita	Jones Family Farms	White/white	6/14	1	24140	32711
Bellevue	Jones Family Farms	Orange/orange	6/14	2	22179	32657
Averre	Jones Family Farms	Red/orange	6/14	1	18925	39173
Covington	Jones Family Farms	Red/orange	6/14	2	18725	30911
Bellevue	Jones Family Farms	Orange/orange	6/14	1	14942	19094
Burgundy	Jones Family Farms	Dark red/dark orange	6/14	1	14220	21770
Murasaki	Jones Family Farms	Purple/white	6/14	2	13445	17373
Murasaki	Jones Family Farms	Purple/white	6/14	1	13349	16262
Covington	Jones Family Farms	Red/orange	6/14	1	11729	25405
Orleans	Jones Family Farms	Red/light orange	6/14	1	8914	36704
14-31	Louisiana State University	Purple/purple	6/14	1	8485	12419
NC-531	Jones Family Farms	Red/orange	6/14	2	6752	11156
NC-531	Jones Family Farms	Red/orange	6/14	1	3671	7747

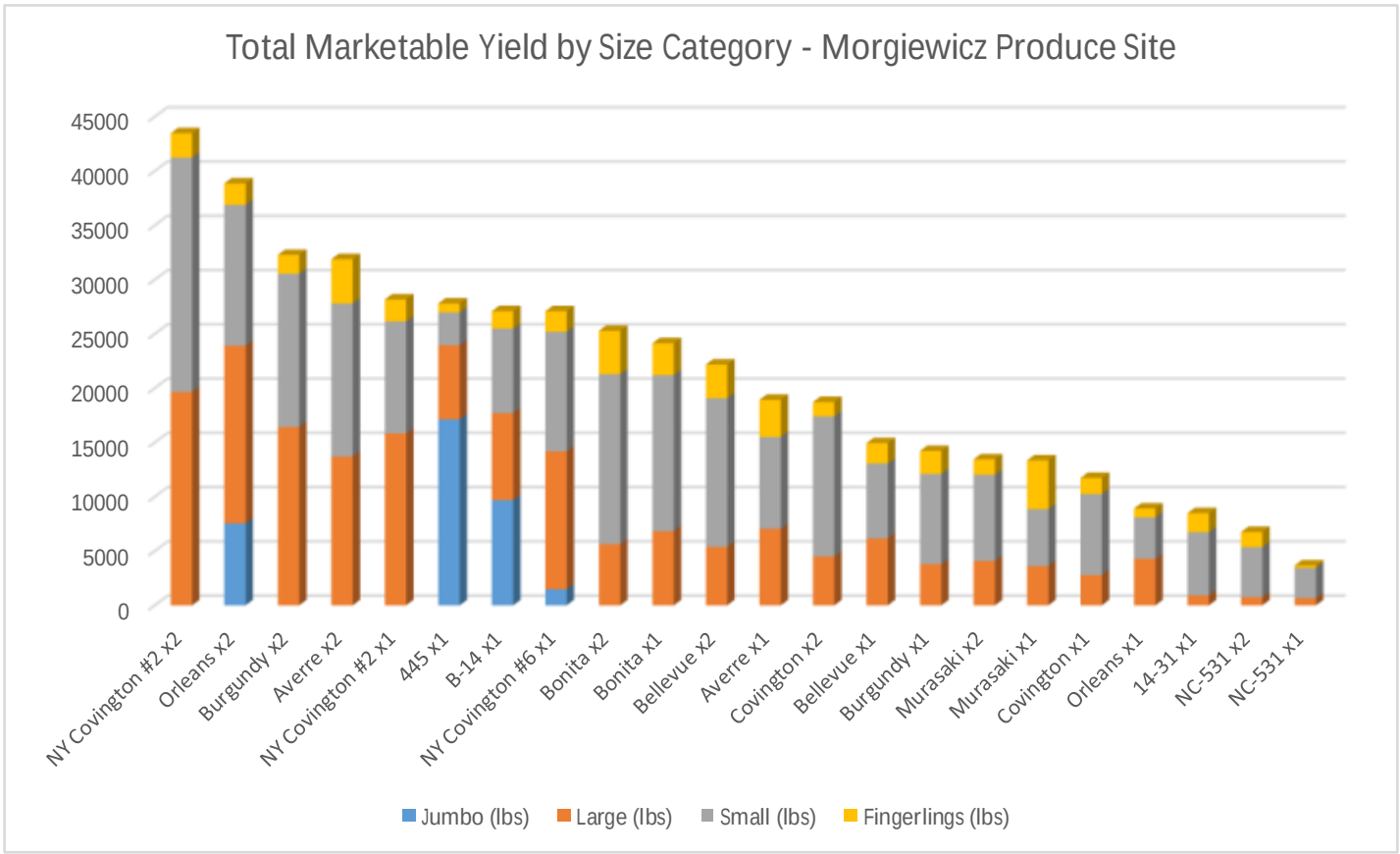

Figure 3: Total marketable yield of sweet potatoes grown at the Morgiewicz Produce, Goshen, Orange County by size category. Please note that the 1x and 2x after the variety name indicates either a single row or double row treatment was used.

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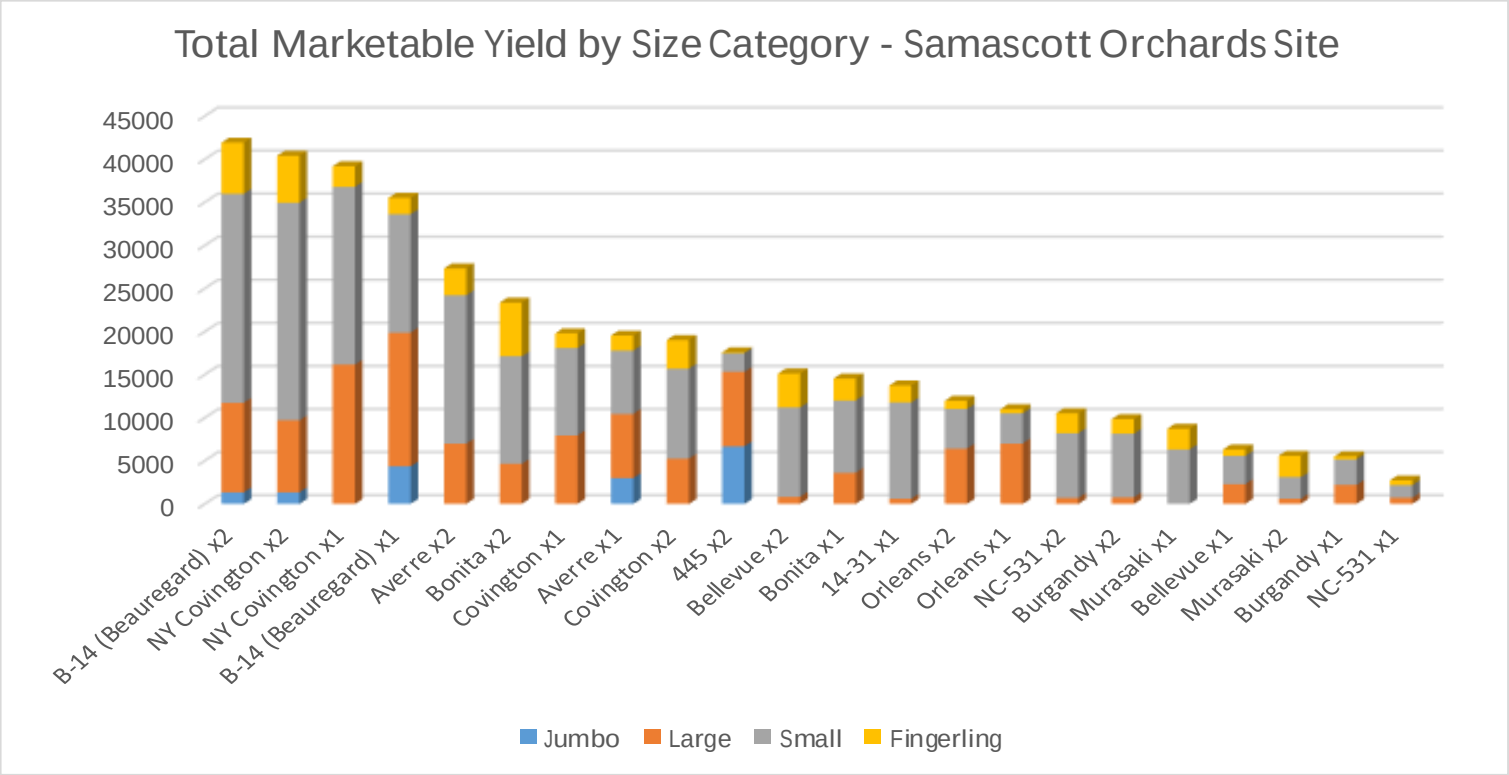

Figure 4: Total marketable yield of sweet potatoes grown at the Samascott Orchards, Kinderhook, Columbia County by size category. Please note that the 1x and 2x after the variety name indicates either a single row or double row treatment was used.

Producing Local Slips from Certified Roots: Even though the cost of slips is relatively inexpensive ($55 - $60 per 1000 plants), shipping is the major cost. One major slip supplier to the Northeast no longer ships slips anywhere in the United States and only offers local pickup. Producing your own slips gives you control over when you plant. In years when it seems to rain for three days straight after you've received your slips and you can't plant, if you're growing your own they just keep on growing until the conditions are right. We are also not reliant on our slip producers down south when those areas suffer from extreme weather events and they cancel shipments. This leaves growers in NY and other minor states with no slips or drastically reduced overall slip orders. This has happened at least 2 times out of the last 5 years.

In order to produce our own slips, we purchased G1 certified Covington roots from Jones Family Farm. These are the same roots they use to produce the slips they sell. Purchasing the roots is advantageous because 1) you can purchase and have them shipped ahead of when you need to start them for slips 2) there is no hurry to ship them overnight like slips 3) if purchased in a large enough quantity, could be shipped via motor freight reducing overall shipping costs ($5.00 - $10.00 per 40 lb box based on 1, 40 box pallet, 3-6 business days).

On April 3, 2019 we received 120 pounds of Covington G1 certified roots from Jones Family Farm. On May 3, we planted roots into 24" long x 15" wide x 7" deep plastic totes (Figure 5) in one of the following growing medias: pure sand (washed play sand purchased from Wal-Mart), wood shavings (animal bedding), BM Pro-mix (potting soil) or a 50/50 mix by volume of sand and BM Pro-mix (Figure 6). In each tote, 2 inches of medium was placed in the bottom and 20-28 roots placed on top of that. More media was added until roots were completely covered. Totes were placed in a greenhouse (Figure 7) on a heat mat with the

Figure 5: Sweet Potato roots arranged in bins getting covered with BM Pro-mix media. Photo: N. Field

Figure 6: Sweet potato roots covered in three different medias and ready for the greenhouse. From left to right: sand, BM Pro-mix, and 50/50 by volume sand plus BM Pro-mix. Photo: N. Field

Figure 7: Sweet potato roots growing in BM Pro-mix media just before cutting on June 6. Photo: N. Field

Figure 8: Sweet potato slips being produced from certified rootstock. Photo: N. Field

Figure 9: Sweet potato slips just cut and ready to be planted. Photo: N. Field

temperature set to 90 degrees F. Roots were watered when dry and slips were cut directly before field planting on June 12 at the Samascott site and June 14 at the Morgiewicz Produce site (Figures 8 & 9).

Results – Samascott Orchards Trial: It took approximately 40 days to produce a slip that we felt was appropriate for cutting and planting. However, because the greenhouse used was unheated and the sides mostly left up, we feel that the number of days to produce slips could be reduced if produced in a greenhouse with consistent air temperatures in conjunction with bottom heat. These roots were also not "pre-warmed" which is normally recommended which could also reduce the slip production time by a couple days. The BM Pro-Mix media resulted in the highest number of harvestable slips with an average of 120 per bin. The 50/50 sand/Pro-Mix media averaged 80 slips per bin. The pure sand and woodchips produced very few slips and were very non-uniform in their emergence and we would not recommend using them at this time. One other note I would make is that the roots need to be as deep as possible with a minimum of 2" of media put on top. More media may need to be added after it has settled in the containers. This may help to elongate the slips and help when cutting.

Compared to the standard Covington slips that we purchased, the NY Covington did not lose a single plant nor did they seem to suffer any kind of "transplant" stress. This is important as the purchased Covington slips were replanted where plants had died up until two weeks after planting to ensure maximum plant populations. Even then plant stands in the single row Covington slips was 24 out of 25 and the double row was 48 out of 50 plants that were planted (Table 1). We also observed that within a week of planting the NY Covington plants had caught up and in some cases surpassed the standard Covington that had been planted 5 days earlier.

Figure 10: An example of a hill of NY Covington sweet potatoes at harvest time from slips grown locally. Photo: C. Bornt

Vines were removed by hand and roots lifted on October 15, 2019. Roots were then graded for marketable size, culls (misshapes, too small etc.), mechanical damage (roots broke, skinned etc. by the harvesting process), rot and rodent damage. The NY Covington grown slips resulted in nearly 2X the marketable yield (single row yield of 40,401 lbs per acre; double row yield of 39,182 lbs per acre) compared to the standard Covington slips which resulted in 19,734 lbs per acre (single row) and 19,011 lbs per acre (double row) (Table 1). Only Beauregard was higher with 41,921 lbs per acre (double row). We also noted that NY Covington roots were more uniform in size and shape and also more cylindrical and straighter compared to regular Covington slips (Figure 10).

Results – Morgiewicz Produce Trial: Because all the NY Covington slips were produced at the same location (Samascotts Orchards), the slip production information is the same as the Samascotts site. Vines were removed by hand and roots lifted on October 4, 2019. Roots were then graded for marketable size, culls (misshapes, too small etc.), mechanical damage (broken roots, skinned etc. by the harvesting process), rot and rodent damage. Yield results were slightly different in this location with NY Covington in double rows producing the highest yield of any treatment or variety at 43,488 lbs per acre (Table 2). That was more than double of regular Covington slips planted in double rows and nearly 4X that of the single row Covington slips.

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Third Trial – Slip Size Effect on Stands and Yield: Another question that I've always asked myself is in regards to the size of the slips that you might receive in a box. I know that as a grower you want to use everything that comes in that box, but should you? Maybe some of you have already figured this out and don't plant those short, one leaf plants, but I thought maybe we could try to put some science behind it and find out.

For this trial we used the variety Murasaki as it was one that I had lots of extra plants of. We then graded slips into the following categories (Figure 11):

- ✓ **Small slips**: 2-3 nodes with small diameter and very short.
- ✓ **Medium slips**: 4-6 nodes and had an average length of at least 6 inches.
- ✓ **Large slips**: at least 7 nodes and 11 inches long.

Murasaki slips were planted on June 13, 2019 at Samascott Orchards on raised plastic mulched beds on 6.5 centers, in a single row configuration down the center at 12" plant spacing. Treatments were replicated three times. Plants that died after planting were not replanted.

Figure 11: Graded slips from a typical box. Photo: N. Field

Results: Using the criteria mentioned above, and grading out 1,000 slips (approximately 1 box), we estimated that there were 680 'large', 130 'medium' and 190 'small' slips in a typical box (some boxes may have more or less plants, but we stopped counting at 1,000). After planting, 'small' slips had the poorest stands at 40% compared to 100% with the 'large' and 80% 'medium' slips. 'Large' slips produced the highest marketable weight at 6,340 lbs per acre followed by 'medium' slips at 5,825 lbs per acre and 'small' slips at 1,647. So, according to these results you are better off discarding the small slips and only plant medium and large slips. However, this was one variety and one trial. I would like to repeat this evaluation using one or two varieties other than Murasaki.

Due to the size and amount of information contained in tables for yield and grading information, please visit our website at https://enych.cce.cornell.edu/submission.php?id=687&crumb=crops|crops|sweet_potatoes|crop*35 to see all the tables and information mentioned in this trial. Pictures of all the varieties are also available.

2020 CSA Farm Market Update—Data from 2019 and Trends

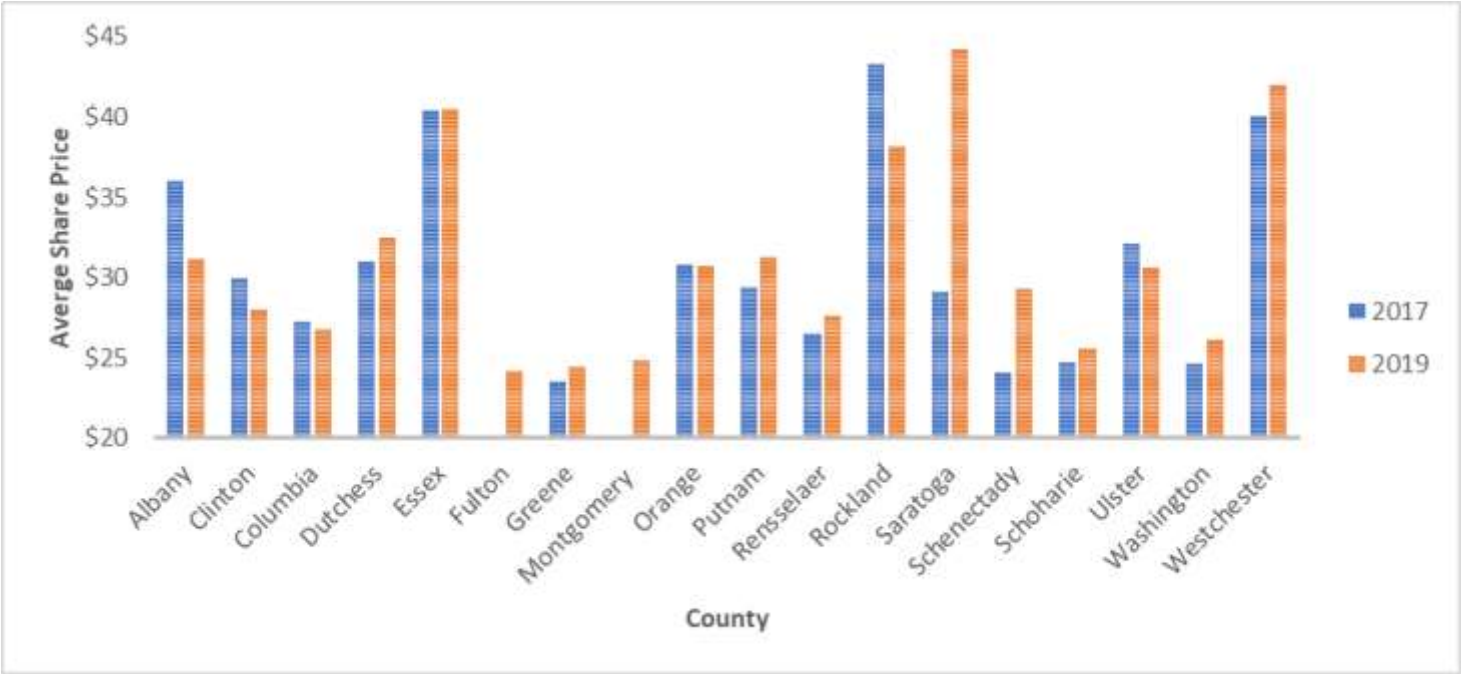
Elizabeth Higgins, CCE ENYCHP

For the past three years we have been capturing CSA farm price and market data for the ENYCH region and NYC. There are 136 vegetable and fruit CSA farms in the database that were in operation with CSAs between 2017 and 2019 and an additional 18 CSAs that only do meat or cut flowers. Many CSAs have multiple sites and the trend is for CSA farms to add additional sites. There were 347 active CSA drop-off sites in 2017 and 372 active drop-off sites in 2019. Workplace CSAs are particularly popular. Here are some of the trends that I have observed in the past three years:

CSA share prices have been flat over the past three years. The average price of a traditional full-size vegetable CSA share box at $29 hasn't changed at all between 2017 and 2019. There is some variation in average price among the counties, but in some counties, this is more a reflection of fewer CSA farms so the average or change in average price is more likely to be skewed based on one farm's prices. There is an increasing number of CSA farms who are using sliding fee scales based on household income or willingness to pay. I don't have data on how they are affecting overall average returns at the farm level, but in my calculation of average share price, I have used the higher end of the scale in tracking the farm's CSA share, not the lower end. The counties listed are where the farms are located, but the share price values are calculated for each of the 372 drop-off sites, averaged by the county where the farm is located.

New York City Shares and Organic Shares are not priced higher than local shares. For the drop-off sites I do track whether the site is in NYC, a Farmers Market or the Farm. I also track whether or not the farm is USDA Organic Certified. Average CSA share prices in NYC and for USDA Organic farms in 2019 were actually slightly lower than average and considerably lower than CSA share prices for boxes delivered to farmstands or farmers markets. Only 34 CSAs in the ENYCH region were USDA Certified Organic and most of these farms are established CSAs that sell shares in NYC. Other reasons for lower NYC share prices might be smaller CSA share sizes and competition for customers in NYC with other CSAs and other food delivery services.

Farm market CSA card. Increasingly CSAs in the ENYCH region are adopting the farm CSA card. In this model consumers pre-pay a set amount and generally get a bonus ($300 prepayment gets you $330 worth of vegetables). Usually the consumer then pays the



farm stand rate for the produce that they select and the value is taken from the card. Farmers I talk to about this option like it for both the convenience and the fact that, for farms that sell at markets it helps encourage customer loyalty. In 2017, I identified 16 farms offering some type of Farm Card CSA. In 2019 I identified 28 farms that use this form of CSA membership. For some of these farms, the farm CSA card replaced the traditional box CSA. But for 12 farms the farm card is offered as another choice for consumers in addition to the CSA box. 14 farms use the card at their farm's on-farm market or stand and 20 farms use it at their farmers market. Only four farmers markets (Schenectady, Troy, Keene Valley and Saranac Lake) currently have more than one farm offering a farm market CSA card at their stand, but it is likely that there will be more competition in this area in the future.

Another change with the card that I am seeing is more flexibility in the initial amount. In 2019 the average minimum price of a farm CSA card was $388 which is very similar to the 2017 average rate of $386, but in 2019 more farms allowed minimums of $100 or less and more offered flexibility for the consumer to set their own price. None of the CSA market cards offer a low income/subsidized option but many of the farm stands accept SNAP and WIC. If you use this CSA model a best practice for these cards is to let the customer know up front that any balance at the end of the season will not carry over but will be retained by the farm. This helps minimize recordkeeping and financial liability for the farm. These balances would otherwise show up as a liability on your books if carried over.

Home Delivery is another trend. In 2017, 3 farms offered home delivery of CSA shares. The average price of a traditional veggie CSA share delivered in 2017 was $33.55 per week. Delivery was to NYC, Capital District/Troy, Lake Placid Region and Rhinebeck. In 2019 5 CSA farms offered home delivery. The delivery region was the same as 2017, with the addition of Saratoga and Schenectady and northern NJ. The price of a traditional veggie CSA share delivered in 2019 was $30.63 (these prices do not include the CSA delivery to NYC, which included meat and other products).

Things I am concerned about: If you are looking to build your CSA share numbers through added customer convenience either through home deliveries or through more drop-off sites for fewer customers, make sure that you are including costs of delivery and time into your pricing. As delivery costs increase, especially into NYC, farmers should be communicating to their customers the real costs of delivery. Unfortunately, many customers in the Amazon Prime era have gotten used to free or low-cost delivery which is a strategy that even large-scale food companies (grocery stores, meal kits) struggle to make profitable. It is true that customers balk at actually seeing the cost of shipping – so your best strategy is to build the cost into the cost of the product and highlight the value, not tack a huge delivery cost onto the end.

Winter High Tunnel Production Tips from the Pros

Elisabeth Hodgdon, CCE ENYCHP

Overwintered lettuce in January in a Hudson Valley high tunnel. Photo: E. Hodgdon

In December, I attended the New England Vegetable and Fruit Conference in Manchester, NH. The conference, held every other year, is a gathering place for growers, extension, and industry from all over the Northeast to learn about the latest in production practices and catch up with old friends. At the conference, I attended two sessions on winter high tunnel production. One featured highlights from the 2019 Frozen Ground meeting, a grower-organized winter production conference. The second was a farmer-to-farmer session where growers could share their tips for what works on their farm for maximizing winter yields. These sessions were incredibly valuable for learning tips and tricks from pros who had been growing for decades, from newer growers with fresh ideas and production practices, and everyone else in between. Here, I share with you some of the advice shared during the conference from growers.

Crops and varieties

Spinach is the most reliable winter crop in the Northeast, the breadwinner of the winter high tunnel. Johnny's Selected Seeds ranks this crop in "Tier 1," or the "easiest to grow" crop for winter production. Growers recommended planting more than one variety to hedge your bets, and selecting varieties with the best disease resistance, more specifically, resistance to as many downy mildew races as possible.

Although a little more challenging to grow reliably, many growers at the meeting shared their tips for growing winter lettuce. Because lettuce is less cold tolerant than spinach, some growers will plant large successions of lettuce that mature before the onset of the "Persephone Period", the slow-growing period when days are less than 10 hours long. They will store them unwashed in a cooler for up to six weeks, taking them out and washing them for sales as needed. I was surprised that one grower in the audience from Alaska reported being able to produce 'Salanova' lettuce in the winter there, in Zone 3!

Growers in the audience were divided on whether it is worthwhile to grow carrots in winter high tunnels. Farms that have their carrot storage perfectly dialed in preferred selling carrots from the fall harvest instead. Other farms reporting being able to sell very small bundles of overwintered carrots in the early spring for as much as $4 per bunch. Being able to maintain attractive green foliage on the carrot bundles was an important factor in keeping overwintered carrot prices high enough to make them worth the tunnel space.

Using row cover

Some growers question whether it's worth it to use row cover in the winter, and more specifically, if it's worthwhile to constantly remove and recover crops. While spinach can overwinter in unheated high tunnels without row cover (which we do in our experimental trials at the Cornell Willsboro Farm), other crops will have lower winter survival without it. To really maximize yield, experienced growers recommended using two layers of row cover, keeping the cover close to the plants, and removing it whenever the weather is sunny in the tunnel. Removing the covers improves air circulation and allows the plants a chance to photosynthesize. They will then recover the plants at night to hold in the heat from the day. On cloudy days, they will often not bother uncovering the plants. On the other side of the spectrum, some growers opt for a lower maintenance approach by leaving the covers on all winter, saving on labor.

Disease management

Jud Reid, CCE Regional Vegetable Specialist from the Cornell Vegetable Program, wrote an excellent article on cultural disease control

in winter high tunnels (see sources below) that echoed the growers' recommendations at the conference. To start, choose disease-resistant varieties and use a hot water seed treatment to kill any seedborne pathogens that could be infesting the seeds. Second, make sure to ventilate your tunnels in the winter. Chris Callahan from UVM Extension believes that a widespread problem in high tunnels in the Northeast is under-ventilation. Plant pathogens thrive in humid environments. By removing row covers as much as possible, air can circulate through the crop canopy to dry condensation on the leaves. Opening vents and using fans for horizontal air flow in the winter can go a long way for disease prevention.

Irrigation in the winter: should you do it?

Should you irrigate in the winter? This question also had growers divided. Chris Callahan reported that in his survey of growers, about half do not irrigate in the winter, or irrigate very minimally. In the farmer-to-farmer session in Manchester, few of the growers said that they irrigate their winter crops, and none did any foliar feeding in the winter.

While irrigation is necessary in the fall and spring when days are longer and temperatures are higher in the tunnel, irrigation is less frequently necessary in the depths of the winter when plants are not growing. Additionally, wetting the leaves with irrigation water creates an environment favorable for plant pathogens.

Final thoughts on winter growing: is it profitable?

Winter growing can be a lucrative endeavor for some growers if there are local seasonal markets for their products. Farmers markets, sales to restaurants, and winter CSA's were the most common outlets shared at the conference. Offering spinach and other leafy greens draws in customers to farmers market tables and makes root vegetable-heavy winter CSA shares more appealing. Some growers want to take the winter "off" from vegetable farming in favor of other endeavors, whether it's to work at a seasonal off-farm job, or have more leeway to go on vacation. If you're interested in trying winter growing, I recommend taking a look at the recommended resources below to decide if it is right for your farm.

References and Additional Resources

2019 Proceedings and Presentations from the New England Vegetable and Fruit Conference, https://newenglandvfc.org/past-conference-proceedings-presentations/2019-proceedings-and-presentations

Eight tips for winter success, by Ben Hartman in Growing for Market. 2014. https://www.growingformarket.com/articles/Eight-tips-for-winter-success

Cultural methods to reduce disease in winter high tunnel greens, by Jud Reid. 2013. http://www.hort.cornell.edu/expo/proceedings/2013/Leafy%20Greens/Leafy%20Greens%20Reid%20Winter%20Tunnel%20Disease.pdf

The Winter Harvest Handbook, by Eliot Coleman. 2009. Chelsea Green Publishing.

Elisabeth Hodgdon and Jud Reid recently produced a webinar titled, "Introduction to Winter Growing" that covers the basics of crop possibilities, planting dates, pest management, and marketing of winter high tunnel vegetables. It can be found on the ENYCHP YouTube site: https://www.youtube.com/watch?v=qbAg4fovYL8&t=86s

Winter arugula uncovered on a sunny day. Photo: E. Hodgdon

Understanding and Controlling Tomato Brown Rugose Fruit Virus

Dr. Andy Wyenandt, Rutgers Cooperative Extension

(Adapted from: January 9, 2020, Plant & Pest Advisory, Rutgers Cooperative Extension)

Please be on the lookout for symptoms of Tomato Brown Rugose Fruit Virus this season. The virus can be spread by handling infected imported fruit purchased at a grocery store. If you suspect that your tomatoes are infected, please report the symptoms and send samples for testing to Cornell's Plant Diagnostic Clinic, which will soon have the ability to test for the virus.

Tomato Brown Rugose Fruit Virus (ToBRFV) is an emerging virus in greenhouse tomato production worldwide. The virus was first identified in Israel a few years ago and has since been found in Europe, Asia, Mexico, and the US. The pathogen is known to be present in greenhouse tomatoes in Mexico, and has occasionally been found in field tomatoes grown there (UMASS); it has also been found on imported fruit in FL (Also see VGN story below). An outbreak was reported (and contained) in CA in early 2019 but, unfortunately, the virus was found in greenhouse tomato production in New Jersey this past fall.

ToBRFV is more severe on young tomato plants and can result in 30-70% yield loss (UFL). Foliar symptoms of ToBRFV on tomato and pepper include deformed, crinkled leaves, mosaic, mottling, flecking, chlorosis, and/or necrosis (see images). Fruit symptoms include discoloration and rough brown patches or ringspots. Irregular fruit shape and maturation patterns may also occur. Browning of the veins in the fruit calyx in the early stages of fruit ripening may also be observed. Symptom expression can vary widely among tomato cultivars (UMASS); while some green fruit may be infected but remain asymptomatic until the fruit starts to ripen.

ToBRFV is a member of the tobamovirus family along with tobacco mosaic (TMV), tomato mosaic (ToMV), and tomato mottle mosaic (ToMMV). ToBRFV is especially worrisome for tomato growers because it has overcome the Tm-2^2 gene that confers resistance to tobamoviruses in many tomato cultivars. Like TMV, **ToBRFV is very stable and easily transmitted by mechanical means**; in a highly managed crop such as greenhouse tomatoes, this means that human activity is the primary vector. The virus may also be transmitted mechanically by bumble bees employed to pollinate greenhouse crops. The virus can be seedborne and research indicates that it is associated with the seed coat, not the embryo.

Management practices for ToBRFV include planting of disease free seed and seedlings, scouting plants regularly for symptoms, and isolating symptomatic plants. Disinfect tools and workers' hands frequently. Recent research has demonstrated that the most effective disinfectants include 10% bleach, 50% Lysol, and 20% nonfat dry milk (UMASS). Currently, no commercial tomato varieties are tolerant to ToBRFV. Peppers with tolerance to TMV and pepper mild mottle virus (PMMoV) have shown some tolerance (MSU). ToBRFV's high stability allows it to stay infectious in the soil, in plant debris and on stakes for long periods—up to 20 years. There are reports of spread by bumble bee pollinators in greenhouse situations. However, there are no reports of plant-to-plant transmission by aphids, leafhoppers or white flies (MSU).

There are no sprays that can be applied that are effective in helping to reduce the virus's spread. Seed and transplant production are the most critical steps since contamination at these steps may create a risk of further contamination (MSU). A number of County Offices have the equipment for doing the hot water seed treatment method. Please contact your county agent for more information. Importantly, as a note, there is very limited to no information on infested seed sources, with only a few greenhouse tomato cultivars with known problems.

Recommended actions include (from MSU):

- Start with certified clean or treated seed from a reputable dealer. Do not purchase seed from unverified sources, especially if they come from known restricted areas.
- Have greenhouse workers wash and sterilize hands and tools often.
- Supply single-use gloves that are discarded between greenhouse ranges.
- Provide protective clothing that stays in that greenhouse range or that is well washed before going to another range.
- Dispose of symptomatic plants and plants within 5 feet of infected plants. Also, dispose of plants, strings, trays and media through incineration—**DO NOT** spread it out on your fields (or reuse it for other crops in the greenhouse)!
- Monitor movement of equipment and workers between fields. Thoroughly wash equipment and possibly have workers bring a change of clothes.
- Rogue and incinerate symptomatic plants and conduct any daily activity last in that greenhouse followed by good sanitation.

On November 15, 2019, USDA/APHIS issued an emergency federal order that calls for pre-export testing of tomato and pepper

propagative material (plants, seeds, grafts, and cuttings) and fruit produced in any country where ToBRFV has been detected; to date, this list includes Israel, Jordan, Turkey, Greece, Italy, the United Kingdom, the Netherlands, China, and Mexico. Countries where ToBRFV has not been reported may state this fact by providing a letter from the nation's plant protection organization: propagative material and fruit exported to the USA will then be exempt from the testing requirement. Tomato and pepper fruit from Canada will also be subject to inspection prior to export, because Canada imports these crops from Mexico and re-exports them to the US. US Customs and Border Protection will also increase inspections at U.S. ports of entry to ensure imported tomato and pepper fruit from Mexico, Israel, the Netherlands, and Canada are free from symptoms of ToBRFV. (UMASS, USDA)

Figure 1. ToBRFV fruit symptoms. (A-C) Symptomatic mosaic pattern on leaves of cluster tomato plants cv. Mose. (C) Narrowing leaves of cluster tomato plants. (D) Dried peduncles and calyces on cherry tomato plants cv. Shiran leading to fruit abscission. (E) Necrotic symptoms on pedicle, calyces and petioles cv. Ikram. (F) Typical fruit symptoms with yellow spots cv. Mose. (G-I) Variable symptoms of tomato fruits cv. Odelia. (G) The typical disease symptoms. (H) Symptoms of mixed infections by the abundant TSWV and the new tobamovirus isolate. (I) Unique symptoms of the new tobamovirus isolate found at a single location at Sde-Nitzan village. Photos by Neta Luria et al./PLOS https://creativecommons.org/licenses/by/4.0/

References:

Dr. Angela Madeiras (UMass): http://ag.umass.edu/greenhouse-floriculture/fact-sheets/tomato-brown-rugose-fruit-virus-tobrfv

Dr. Ron Goldy (Michigan State University): https://www.canr.msu.edu/news/tobrfv-a-new-concern-for-tomato-and-pepper-producers

Kendall Stacy (University of Florida): http://blogs.ifas.ufl.edu/pestalert/2019/07/23/tomato-brown-rugose-fruit-virus/

American Seed Trade Association: https://www.betterseed.org/wp-content/uploads/ToBRFV-QA.pdf

USDA/APHIS: https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/2019/sa-11/tomato-brown-rugose-fruit-virus

Vegetable Grower News: Tomato Brown Rugose Virus Concerns Growers

Copper Resistance in Bacterial Leaf Spot Found in New Jersey

Dr. Andy Wyenandt, Rutgers Cooperative Extension

(Source: January 9, 2020, Plant & Pest Advisory, Rutgers Cooperative Extension)

Copper resistance has been detected in bacterial leaf spot (*Xanthomonas euvesicatoria*) on tomato and pepper and in *Pseudomonas chicorii*, the causal agent of bacterial leaf spot in basil as well as multitude of other hosts in New Jersey. While not surprising, copper resistance has been known to develop for decades now; however, this is the first time it has been confirmed in vegetable crops in New Jersey. Copper applications for the control of bacterial diseases in many crops has been a mainstay for decades now and is often applied in weekly protectant fungicide programs. In 2019, with help from Dr. Nrupali Patel and Dr. Don Kobayashi, bacteriologists in the Department of Plant Biology located on the New Brunswick campus, a survey was begun to determine which species of bacterial leaf spot are most prevalent in New Jersey vegetable crops. Bacterial leaf spot can be caused by four species of Xanthomonas: *X. euvesicatoria*, *X. vesicatoria*, *X. perforans*, and *X. gardneri.* Currently, there are four races of BLS found in tomato (T1-4) and eleven races found in pepper (0-10). Differential tests in southern New Jersey using various bell pepper lines over the past 15 years has suggested that the number of races of BLS in pepper has increased over time; with all races present in the state to date. Early lab testing results from samples collected on a small number of NJ vegetable farms last summer has shown the presence of *X. euvesicatoria*, which can infect both pepper and tomato crops, with some of the samples testing positive for copper resistance.

How do you know what species of bacteria are present on your farm?

The only way to determine which species of bacteria are present in tomato or pepper crops on your farm are to have them identified through laboratory methods.

How do you know what races of the pathogen are present on your farm?

That's a difficult question to answer. Up to now, the only way to know is through differential testing. That means planting a number of different bell peppers with varying BLS resistance packages and monitoring which cultivars develop symptoms. For example, if you detect BLS development in Aristotle X3R (which has resistance to races 1,2, & 3); then you possible have races 4-10 present on your farm. If you were to plant Turnpike in that same field and you have BLS development in it, then you possibly have race 6 or 10 present, because Turnpike has resistance to BLS races 0-5 and 7,8,9. It's extremely important to know what races of BLS are present so you can chose the proper cultivars to grow. Choosing the proper cultivar will do two things: significantly reduce the chances of BLS development and significantly reduce the number of copper applications on your bell pepper crop. As a note, there are a few non-bell peppers available with BLS resistance packages (see 2020/2021 Commercial Vegetable Production Recommendations Guide).

How do you know if copper resistance is present on your farm?

Growers who have used copper applications for controlling bacterial leaf spot in crops such tomato or pepper for many years should always monitor for efficacy. If you notice or have noticed a loss in copper efficacy over time, then there is a good chance copper resistance is present. Once copper resistance is detected, further applications will be unwarranted and ineffective. The only method to truly determine if copper resistance is present is through laboratory testing, however growers who pay close attention to efficacy should have a good idea if copper is still effective.

What can you do to mitigate bacterial leaf spot development on your farm?

In crops such as bell pepper, it comes down to growing cultivars with resistance to BLS and knowing what races are present on your farm. Many of the recommend commercial cultivars have varying resistance packages to the different races of the pathogen. Some cultivars, such as Paladin which has Phytophthora resistance has no resistance to BLS. Other "older" cultivars such as Aristotle X3R has resistance to races 1-3; newer cultivars such as Turnpike has resistance to races 0-5,7-9; while cultivars such as Playmaker and 9325 have resistance to 0-10 (also known as X10R cultivars). Unfortunately, BLS resistance in commercial tomato varieties are lacking, but efforts from around the world are making progress.

High Tunnel Tomato On-Farm Research Project Seeks Growers

Rebecca Maden, UVM Extension

We are inviting growers in Vermont and nearby states to participate in a 2-year study to improve our understanding of the fertility needs of high tunnel tomatoes grown in the ground. The project will pay for soil tests at the UMaine lab and provide customized fertilizer recommendations for your tunnel(s). Growers must agree to grow at least one bed of red, indeterminate slicing tomatoes, follow the soil test recommendations, and track yields. If interested, please review the participant agreement for details and then contact Becky Maden with questions or to sign up, ideally by the end of the month at (802) 773.3349 x 277 or rebecca.maden@uvm.edu.

USDA Value Added Producer Grant

Elizabeth Higgins, Ag Business Management

Value Added Producer Grant applications are now being accepted. The Application deadline (paper): POSTMARKED and mailed by March 10, 2020 to either Gary Pereira, USDA Rural Development, 9025 River Rd, Marcy, NY 13403 ***OR*** Thomas B. Hauryski, USDA Rural Development, 415 W. Morris St. Bath, NY 14810.

The Value-Added Producer Grant (VAPG) program helps agricultural producers enter into value-added activities related to the processing and marketing of new products. The goals of this program are to generate new products, create and expand marketing opportunities and increase producer income. Grant and matching funds can be used for planning activities or for working capital expenses related to producing and marketing a value-added agricultural product. Examples of planning activities include conducting feasibility studies and developing business plans for processing and marketing the proposed value-added product. Examples of working capital expenses include: Processing costs; Marketing and advertising expenses; Some inventory and salary expenses.

Eligibility: Independent producers, agricultural producer groups, farmer- or rancher-cooperatives, and majority-controlled producer-based business ventures, as defined in the program regulation, are eligible to apply for this program.

Funding: The total funding available is $37 million. The maximum planning grants is $75,000; the maximum working capital grants: $250,000. The grant program requires a 50% match and the matching funds must also be an eligible expense for the grant.

Application materials were not available on USDA's website at the time of newsletter printing, but can be accessed at this site https://sites.google.com/a/cornell.edu/higgins/home/grants. For official information about the program see USDA Rural Development's website at https://www.rd.usda.gov/programs-services/value-added-producer-grants. I will be holding a webinar on the VAPG answering questions on Monday January 27th and Monday February 3rd, or you can contact me at emh56@cornell.edu if you have questions about the grant program. Registration for the webinar is on the ENYCH website.

Upcoming Events

In-Depth Strawberry Substrate Workshop *(sponsored by the NYS Berry Growers Assoc.)*
February 11-13, 2020
Ithaca, NY
Cost: $195 NYSBGA members, $245 non-members

Growing strawberries in substrate (soil-less media) can help prevent soil-borne diseases. It can also increase yields, improve quality, and reduce the costs associated with pesticides, fertilizer, and water. In this 3-day workshop, led by Dennis Wilson of Delphy, a worldwide leader in food and flower production based in the Netherlands, we'll combine classroom and hands-on sessions in Cornell's greenhouses to learn about the most effective methods for strawberry substrate production.

Breakfast, lunch, and printed handouts included. A block of rooms have been reserved at the Best Western University Inn, 1020 Ellis Hollow Road, Ithaca, New York 14850. The cost is $129/night. Breakfast and shuttle will be provided to guests that stay here. The direct number to the hotel is (607) 272-6100.

For more information and to register, visit https://www.nysbga.org/berry-growers/2019/12/9/join-us-for-our-in-depth-strawberry-substrate-workshop-211-21320.

2020 ENY Fruit & Vegetable Conference
February 25-26, 2020—The Desmond Hotel & Conference Center, Albany, NY
Join us for our annual conference with two full days of informative sessions on Tree Fruit, Vegetables, Small Fruit, Grapes, Hemp, and much more. For more information and to register, visit: bit.ly/2020fruitandveg

Produce Safety Alliance Grower Training
February 25, 2020—The Desmond Hotel & Conference Center, Albany, NY
A grower training course developed by the Produce Safety Alliance (PSA) that meets the regulatory requirements of the Food Safety Modernization Act (FSMA) Produce Safety Rule. At least one person per farm producing more than $25,000 worth of fruits and vegetables must attend this course once. Participants will receive a certificate of course completion by the Association of Food and Drug Officials. For more information and to register, visit: bit.ly/FebruaryFSMA

Diversifying Production on Small Farms—A Webinar Series about Opportunities
Feb 20, Feb 27, Mar 5, Mar 12, and Mar 19, 2020
Whether you are an existing or aspiring farmer, join us for a five-part webinar series where experts provide overviews of diverse enterprises that might work for your business. For more information and to register, visit: bit.ly/DiversifyingProductionSeries

Effective Management of Farm Employees: Eastern NY Session
March 2-3, 2020—CCE Dutchess County
9:30am—4:30pm
CCE ENYCH program in collaboration with the Cornell Small Farms Program and the Cornell Ag Workforce Development Program will again be offering the Effective Management of Farm Employees class at CCE Dutchess County in Millbrook NY. The course covers: Moving From Individual Performer to Supervisor; Onboarding New Employees and Performance Management including effective communication, developing training and assessment programs that get your employees off to a good start and providing timely and supportive feedback to get the best out of your staff. Tools we will discuss include using standard operating procedures, other communication strategies, training resources and feedback and incentives.
For more information, visit: https://enych.cce.cornell.edu/event.php?id=1361

2020 Orange County Onion School
March 6, 2020—Pine Island Fire Department, Pine Island, NY
Join experts from Cornell Cooperative Extension, Cornell University, and the University of Georgia for a day full of updates on best practices for muck onion production in New York. Researchers will share the results from trials studying herbicide efficacy, pink root management in transplanted onions, Stemphylium leaf blight fungicide programs, timing of copper applications for reducing bacterial bulb rots, adjuvant selection and use, and more! For more information and to register, visit: bit.ly/OnionSchool2020