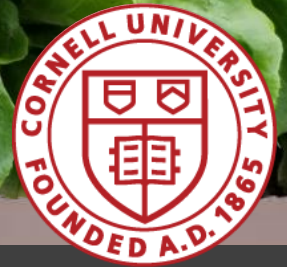


June 19, 2019  
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# Vegetable News



## Be Prepared for Basil Downy Mildew

*Ethan Grundberg, ENYCHP, Cornell Cooperative Extension*

Basil downy mildew (BDM) was already reported in several field plantings in southern New Jersey last week, much earlier in the season than is typical. The first symptom of BDM is usually the development of angular yellow patches on the top side of basil leaves, followed shortly by the arrival of purplish gray spores on the leaf underside. After sporulation, the yellow patches turn brown and gray.

Growers have increasingly been planting the variety 'Eleonora' by Vitalis Organic Seeds due to its intermediate resistance to BDM. However, 'Eleonora' is still very susceptible and growers should still monitor their plantings of resistant varieties carefully. Purple and Thai type basil typically have better resistance than sweet Genovese types. Rutgers released three new BDM-resistant sweet and Genovese basil varieties in 2018: 'Obsession DMR', 'Devotion DMR', 'Passion DMR', and 'Thunderstruck DMR'. These varieties have been included in field trials at the Long Island Horticultural Research Laboratory and have demonstrated superior resistance compared to other commercially available varieties with intermediate resistance. All three are available through VDF Specialty Seeds (<https://www.vdfspecialtyseeds.com/>). There are several other commercially available basil varieties on the market now with improved BDM resistance, including Prospera and Amazel.



However, Dr. Meg McGrath recently wrote the following: "New resistant varieties have exhibited better resistance than those commercialized previously, but plant resistance is rarely complete, thus some symptoms are expected warranting fungicide treatment when symptoms are first found to achieve good control. Pathogens have demonstrated ability to

*Early basil downy mildew symptoms on the upper leaf surface. Photo: Ethan Grundberg*

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evolve to overcome resistance. Meg McGrath is involved with a multi-state project on this disease that includes researchers who will be looking at genetic variation in the pathogen. Examining isolates from resistant varieties is of special interest. If you see downy mildew on a resistant variety, please contact her at 631-727-3595 or [mtm3@cornell.edu](mailto:mtm3@cornell.edu)."

The best cultural practices to avoid BDM are those that minimize leaf wetness and humidity levels, especially in high tunnels. In order to effectively manage BDM, fungicide applications should begin before visual symptoms develop. Ranman (cyazofamid; FRAC code 21), Revus and Micora (mandipropamid; FRAC 40), and Quadris (azoxystrobin; FRAC 11) are all labeled for use on basil for BDM. Studies conducted on Long Island in 2013 found that Revus and Ranman were most effective at controlling BDM on both 'Italian Large Leaf' and 'Eleonora' varieties. Revus and Ranman can be rotated with any number of phosphorus acid (FRAC 33) fungicides labeled for use on basil like ProPhyt, Fosphite, Fungi-Phite, Rampart,

pHorsepHite, and K-Phite. The same study tested the efficacy of several OMRI-approved fungicides as well (Regalia, Actinovate, and Trilogy), but found them to be mostly ineffective. Some studies have found Procidic (3.5% citric acid) to be somewhat more effective for organic growers and was deemed NOP compliant by the Washington State Department of Agriculture. Double Nickel 55 (*Bacillus amyloliquefaciens*), MilStop (potassium bicarbonate), Trilogy (neem oil), and OxiDate (hydrogen dioxide) are also labeled for use on basil for suppression of BDM. Since OxiDate is a contact fungicide with no residual activity, it should only be used in conjunction with another fungicide. If you are unable to control BDM on your crop, be sure to disk in the infected plantings as soon as possible to help reduce the inoculation source for other plantings.

For more information on BDM, please refer to <http://vegetablemendonline.ppath.cornell.edu/NewsArticles/BasilDowny.html> and <http://blogs.cornell.edu/livepath/extension/basil-downy-mildew/>.

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## How Copper Sprays Work and Avoiding Phytotoxicity

**Teresa Rusinek, ENYCHP, Cornell Cooperative Extension**

You may be considering a copper spray to control or prevent certain diseases, particularly bacterial diseases in your crops. Here's a quick review of how copper controls pathogens. Copper is usually applied in the "fixed form" which lowers its solubility in water. Fixed coppers include basic copper sulfate (e.g., Cuprofix Ultra Disperss), copper oxide (e.g., Nordox), copper hydroxide (e.g., Kocide, Champ), copper oxychloride sulfate (e.g., COCS), and copper ions linked to fatty acids or other organic molecules (e.g., Cueva). The spray solution is actually a suspension of copper particles, and those particles persist on plant surfaces after the spray dries. Copper ions are gradually released from these copper deposits each time the plant surface becomes wet. The gradual release of copper ions from the copper deposits provides residual protection against plant pathogens. The slow release of copper ions from these relatively insoluble copper deposits reduces risks of phytotoxicity to plant tissues. Copper ions denature proteins, thereby destroying enzymes that are critical for cell functioning. Copper can kill pathogen cells on plant surfaces, but once a pathogen enters host tissue, it will no longer be susceptible to copper treatments. A copper spray acts as a protectant fungicide/bactericide treatment, but lacks post-infection activity.

Because copper products come in different formulations and have different properties, it is important to read all the information on the labels. Besides rates, you will want to know about compatibility with other pesticides, adjuvants, and fertilizers. Many growers are tank mixing biological fungicides and plant activators with coppers, while many are compatible, some are not, so make sure to check both labels for compatibility or call the manufacture/distributor for technical assistance.

The effectiveness of copper sprays has been correlated with the amount of elemental copper applied. The metallic copper content varies widely by product. Potency also varies by how the product is prepared. Finely ground copper products are more active than coarsely ground ones. Professor Emeritus Tom Zitter, Cornell University, suggests that for vegetable crops "Begin by choosing a copper product with at least 20% or more copper as the active ingredient to insure the greatest release of copper ions".

There are several suggestions for avoiding phytotoxicity (plant injury) with copper sprays. Limit the copper ion concentration on plant surfaces by using copper products that are relatively insoluble in water, i.e. fixed copper. Copper can accumulate to high levels on plant tissue when sprayed repeatedly to cover new growth and there is no rain. In this situation, after a rain event, a large amount of copper ions may be released leading to phytotoxicity. Check the pH of your water source. Solubility of fixed coppers increases under acidic conditions. Copper sprays will become more phytotoxic if they are applied in an acidic solution. Most copper products are formulated to be almost insoluble in water at pH 7.0. As the pH of water decreases the solubility of the copper fungicides increases and more copper ions are released. If the water /solution in spray tank is too acidic (below pH 6.0-7.0, depending on the copper formulation) excessive amounts of copper ions could be produced which may cause damage to fruit and foliage. Formulations vary in solubility — hydroxides are more soluble than oxychlorides which are more soluble than tribasic copper sulphates and cuprous. Less soluble formulations are usually more persistent. Cop-

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per sprays generally cause more phytotoxicity when applied under slow drying conditions, such as when it's wet and cool. Always read the label and follow copper tank mix partner label instructions.

For a comprehensive list of Copper Products Used for Vegetable Disease Control see: <http://vegetablemdonline.ppath.cornell.edu/NewsArticles/CopperFungicides2012.pdf>

For specific information on copper fungicides in organic disease management see: <http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Copper-Fungicides-Organic.pdf>

Sources: Dr. T. A. Zitter, Cornell University and Dr. David A. Rosenberger, Cornell University

## Chuck's Scouting Report for this Week

**Chuck Bornt, ENYCHP, Cornell Cooperative Extension**

**Potatoes:** First off I'd like to just quickly follow up from last week's podcast on Potato Leaf Hopper – I am starting to see a few here in the Capital District region and not surprisingly with all the straw and hay cutting that occurred those couple of nice days we strung together. In my experience, concentrate scouting on early potato varieties (Norland, Red Gold, Yukon Gold etc.) as they seem to be the most impacted by Potato Leaf Hopper (PLH). However, don't forget that snap beans are just as susceptible, if not more!

Usually the first sign in potatoes is what we call hopperburn where leaf tips and margins tend to turn brown and get "crispy" looking or you may also notice a purpling on the tips of leaves. Adult leafhoppers are wedge-shaped, iridescent green in color, and 1/8 inch long (Figure 1). The body is widest at the head. They are very active usually running sideways or flying up in the air only to land quickly. The newly emerged nymph is nearly colorless with red spots that quickly fade. A yellow color soon appears, changing to pale green in the third instar. They do not fly but are very active on the undersides of the leaves. In beans, PLH damage will distort the leaf and plants become stunted and malformed looking.

**Control:** For conventional growers Dimethoate 400 (dimethoate) has been the go to material but many products are effective including many of the pyrethroids (Warrior II, Baythroid, Tombstone, Pounce etc.). Lannate is also another effective material. Keep in mind that usually multiple applications of these materials will be required for control. Voliam Xpress (Coragen plus Warrior) at 5-8 ounces per acre would give you a quick knockdown and 5 days or so of residual control. If there are no Colorado Potato beetles, Assail or Leverage (a neonicotinoid) can also be used quite successfully. If there are Colorado Potato Beetles and you did not use a neonicotinoid at planting as either a seed piece treatment or in-furrow spray (Admire Pro, Advise, Platinum, Cruiser, Cruiser Max, Verimark etc.), then Assail or Leverage would be good choices for both PLH and CPB.

For organic growers, timing and coverage of the plant is essential. Pyganic plus a sticker like NuFilm P or better yet M-Pede (an insecticidal soap with some activity by itself and also helps as a sticker), applied late in the evening will work for a quick knockdown but should be followed up within a couple days with another application. If you have a high pH water, buffering with something

like citric acid to a pH 6.5-6.0 will also improve Pyganic efficacy. Other materials include azadirachtin containing products (Ecozin Plus, Aza-Direct, AzaMax etc.). In addition, Surround, a type of kaolin clay, can also be used as a deterrent (will not kill them), but needs to be applied often to keep new growth covered or to replace what's been washed off by rain or overhead irrigation. However, you need to have good agitation in your sprayer as it can be difficult to spray out and repeated use of Surround can wear out nozzles, so make sure you calibrate after every couple of uses.

**Sweet corn:** We are starting to see European corn borer damage in some early corn and it's probably time to think about spraying plastic and row cover corn. Remember that we treat this corn very differently than we do bare ground uncovered corn and tassel sprays may not always be the most effective. The information below is from the New York State IPM Program's 2019 Sweet Corn Pheromone Trap Network Report:

*Managing ECB in Plastic, Row Cover, or Transplanted Sweet Corn: The*

*usual scouting and threshold recommendations do not apply for row cover, plastic, or transplanted sweet corn that is close to tassel emergence during the first generation flight of European corn borer (ECB). In these early plantings, larvae don't feed in the whorl and emerge in the tassel as they do in bare ground corn. Below are suggestions for timing sprays in season extension corn.*

*Moths will be most attracted to, and deposit the most egg masses in, the most advanced corn, especially fields started under plastic or row cover. Corn that is in late whorl to tassel emergence stage when egg masses are being laid does not show the typical larval feeding in the*



*Yellowing/whitening of sweet corn due to herbicide injury induced by cold, wet soils. Photo: Chuck Bornt.*

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*emerging tassel that we see in bare ground corn that is in the whorl stage during the flight. For this reason, tassel emergence scouting and thresholds have not been successful in plastic and row cover corn. Target newly hatching larvae using the moth trap catches or scout for egg masses to determine when sprays are needed. Growers have had good results when pheromone trap catches were used to time sprays for the first generation ECB in row cover or plastic corn. Growers waited until there was a significant increase in the ECB trap catches in their area and then timed sprays to coincide with egg hatch. ECB eggs require 100 degree days (base 50) from oviposition to hatch. **Two to three applications bracketing the peak moth flight are generally effective.** Degree day calculations for many locations may be found on the NEWA web site: <http://newa.cornell.edu>*

Trap counts are reported weekly in this newsletter. To see the counts from across the state visit <http://sweetcorn.nysipm.cornell.edu/>. Early plastic/rowcover corn ECB management is a good time I think to also consider the insecticides that have longer residual such as Coragen, Voliam Xpress (Coragen mixed with Warrior), Radiant or Blackhawk. Thresholds for ECB are 15% infestation for early tassel and tassel corn or 5% infestation silk stage through harvest.

With all the rain this year, I have seen some nutrient issues and this week I was called into a field of sweet corn. The symptoms included pale yellow to almost white color in the youngest leaves and plants appeared slightly smaller than those not experiencing the symptoms. After asking the grower all the questions that go through my mind, I was convinced it was not a nutrient issue at all but rather an herbicide issue. I have seen these symptoms before and later confirmed with colleagues that it indeed was herbicide injury. The field received the recommended rate of Acuron, same as previous years and similar soils. Acuron is similar to Lumax – both have atrazine, Dual and Callisto, but Acuron also has a fairly new material called bicyclopyrone. This particular planting was planted and the herbicide applied during a particularly cold, rainy period and the mesotrione (Callisto) and bicyclopyrone portion of Acuron caused the whitening/ bleaching of the leaves. I think right after the herbicide was applied we received a significant amount of rain that moved the herbicide into the seed zone and that coupled with the cold, wet soils

caused the discoloration. The corn will grow out of the injury and make a marketable ear, but the question is, how will it affect ear maturity? We decided to go ahead and apply a foliar feed that included a low rate of nitrogen to try and green the corn up and quicken its recovery. Stay tuned to see what happens in the next couple of weeks!

**Asparagus:** I really like asparagus but unfortunately, I feel we usually do not pay it a whole lot of attention in our newsletters. I thought I would at least give those of you growing asparagus some information on conventional weed control thoughts. I know that many of you might already have your plan and are happy with it. For others, you might still be struggling a bit so I reached out to Dr. Bernard H. Zandstra in the Department of Horticulture at Michigan State University. They grow a lot of asparagus in Michigan so I thought that would be a good place to get some information and this is what he recommended:

**Newly established or beds that were at least 1 year old:**

Lorox at 2 lbs per acre as a directed spray plus he said he would consider the addition of 2.4 pints Prowl H2O for improved grass control and residual to the Lorox. This could be followed by a second pass (a couple days later) of Sandea at 0.5 ounces plus non-ionic surfactant. If emerged grasses are still an issue, Select 2EC, Select Max, Poast 1.5EC or Fusilade DX 2EC could be used to control most grasses (be sure to review the adjuvants required for each of these grass materials). Directed sprays or drop nozzles are recommended to ensure thorough coverage.

**For older established beds:** In an established planting, if the fern has grown up already, he recommended 4 lb of Karmex 80 DF per acre plus 3-4 pints of Prowl H2O for residual control. Small pigweeds and ragweed or large yellow nutsedge can be controlled using Sandea at 1 oz per acre plus a non-ionic surfactant. Metribuzin products like Dimetric are also labeled for weeds that are already emerged. You could also consider using 2,4-D and drop tubes for hard to control perennial weeds, but be sure to use the drop tubes and make sure it is a calm day when you apply.



Photo: ENYCHP staff



## Are You Exempt from FSMA?

*Elisabeth Hodgdon, ENYCHP, Cornell Cooperative Extension*

With all the talk of FSMA (the Food Safety Modernization Act) lately, one of the lingering questions in many growers' minds is, "Am I exempt?" While safe growing and handling of produce is important on all farms, knowing whether or not you need to comply with the specific requirements within FSMA's Produce Safety Rule (PSR) will be critical in making management decisions.

Whether your farm is covered by FSMA depends on the type of produce you're growing, your total produce sales, and to whom you are selling the produce.

### *Covered produce*

Fruits, vegetables, herbs, hops, and mushrooms are all part of the PSR. In particular, produce commonly consumed raw presents a greater risk to food safety and is covered by FSMA. The list of produce commonly consumed without cooking is based on consumer surveys. If you grow only produce that is usually cooked, such as sweet corn, potatoes, and pumpkins, you are exempt. If you're growing a mix of covered and uncovered produce, you are still covered by the rule. If all of your produce is going to be processed through a "kill step", such as cooking or canning, you are exempt. Additionally, any produce grown for personal consumption is not covered.

### *Produce sales*

If you sell more than \$25,000 of produce (average for the last three years and adjusted for inflation), you are covered by FSMA.

### *Qualified exemption*

Farms selling over \$25,000 worth of produce may still be exempt from FSMA, depending on total food sales and where they are selling their products. The intention of the qualified exemption is to further lessen the burden of federal regulations on smaller farms. If a farm sells less than \$500,000 in total food sales (such as milk, pies, popcorn, and any animal feed) AND sells the majority of their produce to "qualified end users" they are eligible for a qualified exemption. This includes direct sales to the consumer, such as through farm stands, farmers markets, and CSAs. Additionally, it includes selling produce to restaurants or "retail food establishments" (grocery stores, etc.) within the same state or no more than 275 miles from the farm. Farms with qualified exemptions are subject to modified requirements, including signage, product labeling, and record-keeping.

Lastly, keep in mind that the specifics of FSMA exemptions are not static due to regulatory and inflation changes, and that every farm presents unique situations. Consult the Produce Safety Rule or the New York State Department of Agriculture and Markets directly to determine whether your farm is covered and to determine which practices you must follow for compliance.

Additional resources:

The Food and Drug Administration has a handy color flow chart to assist with determining whether or not your farm is covered by FSMA:

<https://www.fda.gov/media/94332/download>

Fillable worksheet to calculate average total food sales to determine eligibility for qualified exemption, updated for inflation. By Cal Jamerson, K-State Research and Extension.

<https://www.ksre.k-state.edu/foodsafety/produce/index.html>



*Photo: ENYCHP staff*

## Reminder: Foliar Testing for Tomatoes Starts with Early Fruit Set

*Crystal Stewart, ENYCHP, Cornell Cooperative Extension*

High tunnel tomatoes are chugging along despite the cool weather, and many growers should be at or past the point when taking foliar samples is recommended to fine-tune nutrient applications. Taking 3-4 foliar samples per year as the plant moves through early fruit set to full fruit set (every 3-4 weeks) allows growers to address nutrient deficiencies as they appear, rather than waiting for foliar or fruit symptoms to appear. Often as the fruit set really gets heavy potassium levels will drop, warranting regular liquid K applications through the drip to avoid yellow shoulder and improve fruit eating quality. Later, nitrogen levels also fall, shortening the bearing life of the plant and lowering overall yield.

Leaf sampling only takes a few minutes to complete, and from most labs costs around \$25. To take a sample, remove about 20 fully expanded but new leaves (full leaves, not leaflets), and rinse them off to remove any foliar nutrients you might have applied. The lab that I use most often is Waters Ag lab, which provides an easy to understand and comprehensive set of recommendations. But other labs that you might be satisfied with work well, too.

If foliar sampling is new to you, feel free to reach out to your local specialist to do a first sampling together. We are also happy to help you interpret results and make a nutrient management plan.

## Hemp Reminder—Law Enforcement

*Maire Ullrich, ENYCHP, Cornell Cooperative Extension*

This is a reminder as field planting is well-underway, as per your contact with NYSDAM, you must inform law enforcement of your planting locations.

(e) An authorization holder shall, no later than 15 days after having been granted authorization, notify, in writing, the applicable unit or units of law enforcement, including the unit or units of law enforcement in the political subdivision in which the registered premises is located, that it has received such authorization and shall provide such unit or units of law enforcement a copy of the security plan referred to in section 159.2(d)(5) of this Part. The authorization holder shall, no later than 15 days after having notified such unit or units of law enforcement, provide the department with a copy of such notification. An authorization holder shall adequately monitor registered premises under its control and shall notify the appropriate unit or units of law enforcement and the department regarding facts and circumstances that indicate that industrial hemp has been or may be held or possessed in violation of the provisions of this Part.

Also remember that several municipalities' law enforcement may have your farm in their jurisdiction and you should contact all of them (state police, sheriff, town police, village/city police).

Information you supply should include, at least:

- Farm and permittee name/contact info (at all hours)
- the location of the field(s) GPS & street address,
- size of the fields
- copy of authorization or least their authorization number
- copy of your security plan, if you have not already

Making personal contact with an officer in the most direct municipality would be handy too. If there is an issue, there is an officer/chief you have personally spoken to about your production and is familiar with hemp. No, you may not have all of this information EXACTLY, as you plant but send a plan to be in compliance with your authorization. Then send updates as/if it changes.

### *Are You Getting Updates?*

There are weekly updates going out to hemp growers. They are designed for the lower Hudson but much of the information is usable in any geography in New York. If you would like to be added to the list, please e-mail [mru2@cornell.edu](mailto:mru2@cornell.edu).



*Photo: RJ Anderson, Cornell University*



## Farm Service Agency **Electronic News Service**

# BULLETIN

**GovDelivery**

### Prevented Planting Acreage Credit Deadline Extended

USDA Farm Service Agency (FSA) reminds producers to report prevented planting and failed acres in order to establish or retain FSA program eligibility for some programs.

For producers who have prevented planting acres for 2019 spring crops not covered by Non-Insured Crop Disaster Program (NAP), and wish to submit prevented planting acreage credit applications, the **deadline to submit an application is July 15<sup>th</sup>, 2019**. Applying after this date will be subject to late file application provisions.

Due to the widespread excessive moisture, the Deputy Administrator for Farm Programs gave State Executive Directors authority to extend the deadline to July 15. New York State Executive Director Clark Putman then authorized this extension for all New York counties.

For more information, contact your local USDA service center. To locate your local FSA office, visit [farmers.gov/service-locator](https://farmers.gov/service-locator).

#### Questions?

Please contact your local FSA Office: <https://www.fsa.usda.gov/state-offices/index>

### Corn Trap Counts

Location	CEW	ECB-Z	ECB-E	FAW	WBC
Ulster 1	0	0	0	0	0
Orange	6	1	0	26	1
Washington	x	0	0	0	0
Rensselaer	0	0	0	0	0
Clinton 1	0	0	1	0	0
Clinton 2	0	0	0	0	0
Albany	x	2	0	0	0
Columbia	x	2	0	0	0
Ulster 2	1	5	18	0	0



# Upcoming Events

## Summer Pesticide Certification Exam Trainings

July 2, July 9, July 16, July 23, 2019 - 1:30pm-4:30pm  
CCE Clinton County, 6064 Route 22, Suite 5, Plattsburgh

CCE ENYCHP Horticulture Specialists Mike Basedow and Elisabeth Hodgdon will be offering four afternoons of training to review key concepts and study tips in preparation for the exam.

## FSMA/PSA Grower Food Safety Training Course

July 15, 2019 - 8:00am-5:30pm  
CCE Warren County, 377 Schroon River Rd, Warrensburg, 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. To register, visit: [bit.ly/JulyFSMA](http://bit.ly/JulyFSMA)

## Summer 2019, 20-minute Ag Manager Lunchtime Webinar Series

**Focused Business Topics for Busy Managers**  
12:30pm—1:00pm on alternating Tuesdays, June through August

June 18—Making Capital Investment Decisions  
July 2—Understanding Financial Statements 1 (Balance Sheets)  
July 16—Understanding Financial Statements 2 (Income Statement)  
July 30—Understanding Financial Statements 3 (Budgets and Analysis)  
August 13—Ag Tax Topics - the Schedule F  
August 27—Ag Tax Topics - Sales Tax and Property Tax Issues for Ag in NYS

To register, visit: [bit.ly/AgManagerWebSeries](http://bit.ly/AgManagerWebSeries)

## Post-Harvest Washing and Cooling Workshop

August 1, 2019 - Pleasant Valley Farm, Argyle, NY

Workshop will feature FSMA compliant workstations that you can use on your small vegetable and berry farms. There will also be a forced-air cooling demonstration—all things that you can easily (and affordably!) build yourself. Chris Callahan from UVM Extension Ag Engineering program will be leading the workshop. More information soon.

## Willsboro Farm High Tunnel Twilight Meeting

August 27, 2019 - 5:00pm-7:00pm  
Cornell Willsboro Research Farm, 48 Sayward Lane, Willsboro

Join vegetable specialists Elisabeth Hodgdon, Jud Reid, and farm manager Mike Davis for a high tunnel and field tour at Cornell's Willsboro Research Farm, where they will share research results for the following projects:

- Striped cucumber beetle management using netting and row cover
- Varietal differences in cucumber susceptibility to striped cucumber beetle
- Ground cherry and goldenberry production in field and high tunnel environments
- Overwintered high tunnel spinach nitrogen fertility

Depending on availability, a taste-testing of the different cucumber, ground cherry, and goldenberry varieties will be held. This free program is made possible through funding by the Northern NY Agricultural Development Program.

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