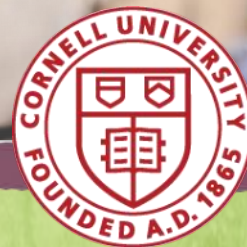


Vegetable News



Blossom Blast and Bumblebees

Amy Ivy—CCE ENYCHP

There are a variety of reasons why blossoms might blast on tomatoes. Blast is a dramatic term for when the blossoms die and fall off before fruit can set. Temperatures over 95, manganese and zinc deficiencies, and pepMV virus are all possible causes. Some plants even do some self-thinning and shed blossoms when their fruit load is too great. But this week was the first time I had heard of the

concept of over-pollination, and it seems several growers are having trouble with this in their early, heated high tunnel tomatoes.

Bumblebees are 'buzz pollinators,' meaning they shake the pollen out of the anthers by buzzing. They bite onto the anthers and then vibrate their bodies to shake loose the pollen. For an amazing video clip of how this works visit: <https://www.youtube.com/watch?v=SZrTndD1H10>. Growers with heated tunnels can start their tomatoes extra early but they need to buy in bumble bees to pollinate since the native ones are not yet active.

Usually this process works fine but sometimes there are more bees than flowers and the hungry bees come back to the same flower multiple times, trying to shake more pollen loose. Too much of this aggressive feeding can kill the flowers (see photos).

Photos: Notice the darkened anthers (blue arrows) and the dropped blossoms (red circles). A little bit of darkening is tolerable but the flowers will drop if this much damage occurs.

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One grower estimates he has lost half of all of his first flower clusters, a loss of about \$2400, so this damage can be serious. The bee supplier has renamed its product line this year and most of our growers are ordering the 'start-up' hive. But this hive was developed for high volume hydroponic producers in mind and has more bees than usual. Our western NY colleague, Judson Reid, said he has

seen this damage in the past when there are too many bees for the number of flowers and the hive needs to be removed. I visited three growers with this problem this week and we would be very interested to know how many others are having this problem. Please call, text or email me (adi2@cornell.edu or 518-570-5991) with your observations or questions.

Growers are Producing Great Transplants Despite Tough Weather Conditions

Crystal Stewart, CCE ENYCHP

The cold, cloudy weather which has defined this spring so far hasn't prevented growers throughout the region from producing quality transplants. Here are some of the key points which are keeping plants healthy and vigorous:

1. **Start plants off right:** a well-built germination chamber will effectively regulate temperature and relative humidity using minimal amounts of energy. You can find a couple of easy to build designs for chambers [here](#). Germination chambers should only be used to "pop" seeds—as soon as you see the first seedlings emerge, remove plants to the greenhouse so they don't stretch.
2. **Water with care:** Cold is ok, cloudy is ok, but cold and cloudy causes real water management challenges. When growers are using supplemental heat to keep temperatures in an acceptable range it can be tough to make the decision to vent excess humidity, so often walking into the greenhouse during those conditions is like walking into the rainforest. High humidity and low light means almost no transpiration by the plants, so soil that is wet stays wet. The best solution to this problem is prevention—if heading into a period of cold, wet days, minimize watering. And don't be afraid to use gable end vents or ridge vents if it is too wet in the greenhouse!
3. **Fertilize equally carefully:** There are a few challenges with fertilizing during cool, cloudy weather. One is that if plants are not taking up water, they aren't taking up fertilizer, either. This might lead to the impulse to fertilize more, which can lead to excess salt buildup and root burning. Another issue is that when temperatures are below 60 degrees F, N fertilizers can convert to ammonium which can be toxic to plants at elevated levels. Successful management of this issue involves scaling back the nitrogen fertility during periods of cool, wet weather, and managing watering to prevent plants



from staying waterlogged. Media with optimal moisture levels will have more nitrifying bacteria, which convert ammonium to useable forms. A full factsheet on managing ammonium can be found [here](#).

4. **Practice good sanitation:** A certain amount of disease is almost inevitable during the growing conditions we've been facing this spring. Scouting the greenhouse regularly and carefully removing flowers with botrytis, watching for crown rots, and adjusting spacing to maximize airflow and light infiltration make it possible to keep plants going through tough times.

High Tunnel Soil Testing Reminder

From Vern Grubinger's newsletter: **Vermont Vegetable and Berry News –April 23, 2018**
compiled by Vern Grubinger, University of Vermont Extension

In established tunnels with relatively high organic matter (compared to the field) it is helpful to use the Saturated Media Extract (SME) test, as well as the regular field soil test (modified Morgan's extract.) The SME test measures water-soluble, immediately available nutrients and the field soil test measures nutrients in reserve, extracted with a weak acid. Both tests measure soil pH and organic matter, but the SME test results also include soluble salts and available N which are important measures for greenhouse soils and potting mixes.

To do the SME test make sure your mix or soil has been moist and warm (room temperature) for at least a week. Send a pint (not a cup as for field soil test) to the soil test lab. The UMaine soil test lab runs both these tests for \$22, calling it the "long-term high tunnel test." See: <http://anlab.umesci.maine.edu/>

Chlorothalonil/ Bravo Shortage

Charles Bornt, CCE ENYCHP

Did you hear about this shortage? Many of you that attended winter meetings probably were made aware that there will be a global shortage of the fungicide chlorothalonil or what you may know more typically as Bravo and various other trade names. The shortage is due in part to the manufacturing facilities in China where this product is made have been shut down for various reasons. Chlorothalonil is a broad spectrum protectant used on many crops and also used commonly as a mixing partner with many of our other fungicides as a tool for resistance management.

What do I do? There are other protectants out there such as copper and mancozeb (active ingredient in Dithane, Manzate etc.) but their labels vary by crop and diseases compared to chlorothalonil products. We will do our best to note these differences during the season in



Chlorothalonil is an important fungicide resistance tool for diseases like Late blight as seen in this potato crop.

the various vegetable crops that we cover in this newsletter and when in doubt, please call one of us to help. The last I heard, there was a little bit of "Bravo" or chlorothalonil containing products in the supply chain, but I can't be sure what's left. Keep in mind that there are a fair number of products (this is not a complete list) out there that are a combination of chlorothalonil and another fungicide such as Quadris Opti (the "Opti" portion indicating that it contains

chlorothalonil), Catamaran (chlorothalonil plus potassium phosphite), Elixir (chlorothalonil plus mancozeb) and Ariston (chlorothalonil plus Curzate). However, please be sure to check the labels to make sure the product is labeled for the vegetable crop you are treating. Some of these pre-mixes are good options as they are probably products you would be adding to your tank mix with chlorothalonil anyway.

The New 2018 Cornell Pest Management Guidelines are now available!

Commodities include: Berry Crops, Vegetables, Tree Fruit, and Grapes.
Field Crops and Greenhouse Crops/Ornamentals are also available.

Please contact Abby Henderson at 518-746-2553, or aef225@cornell.edu if you would like to place an order!



2018
Cornell Pest Management
Guidelines for Berry Crops

Cornell Cooperative Extension

Supplemental Heat for Winter Greens Production: What's the Cost?

Ethan Grundberg, CCE ENYCHP

There seems to be little agreement among winter greens growers regarding the true costs and potential value of using supplemental heat all winter. With support from the Northeast Sustainable Agriculture Research and Education program (NE SARE) and the generous cooperation of the Poughkeepsie Farm Project (PFP), we tried to start gathering some data to add to the high tunnel heating debate. We tracked yield, soil nitrate availability, total nitrogen uptake, propane use, and soil temperature all winter in the two identical side-by-side 42'x 196' double layer inflated poly Harnois high tunnels with one tunnel set to 33 degrees ambient air temperature and the other set to 40.

The data from the trial is still being analyzed, but here are a few key results that have emerged:

- Maintaining adequate soil moisture and, ideally, living roots in the high tunnel before planting is necessary to preserve the soil microbial community that makes nitrogen available for plant uptake.
- Soil nitrate levels were not significantly or consistently different between the two temperatures; however, total nitrogen uptake in the warmer tunnel was higher for curly kale, spinach, and especially for Salanova lettuce.
- The warmer tunnel yielded three harvests in the same time that the cooler tunnel yielded only two.
- It took 979 gallons of propane to heat the tunnel to 33 degrees from November through March. It took 2.1 times as much propane to add the extra 7 degrees to reach 40 over the same period.



Winter greens in a high tunnel heated to 40 degrees at the Poughkeepsie Farm Project

- Fertilizing to 70 pounds/acre of nitrogen in September provided sufficient nitrogen to kale, spinach, and Salanova until mid-February.
- Targeted early spring fertigations with soluble Chilean nitrate carried those crops to maturity in early April

A big thanks to the great crew at PFP for all of the help tracking yield! Going forward, a group of vegetable specialists with Cornell Cooperative Extension hopes to continue to investigate fertility management in winter high tunnels generally and specifically the interplay between supplemental heating and nitrogen. If you are interested in collaborating, please reach out to Ethan at eg572@cornell.edu.

Governor Cuomo Announces More Than 60 New Industrial Hemp Research Partners Join New York State Pilot Program

Governor Andrew M. Cuomo announced in early April that more than 60 new farms and businesses have received research permits under the State's Industrial Hemp Agricultural Research Pilot program. These new research partners expand across the state, including seven counties in the Southern Tier, and will focus their studies in biotechnology and agronomics, among other areas. Additionally, for the first



time, [applications](#) for future research partners in the areas of food and fiber will now be accepted on a continuous basis.

To broaden New York's Industrial Hemp Agricultural Research Pilot Program, Governor Cuomo announced an [open](#)

[solicitation](#), which ended in November 2017, drawing applications from more than 100 farms and

continued on next page

businesses. Currently, 62 applicants have received research permits for the 2018 growing season with additional research partners in the approval process. In addition, 18 New York companies have registered to process industrial hemp, which is key to advancing market research and supporting a growing demand for industrial hemp products nationwide.

To continue advancing the pilot program in the Southern Tier and throughout the state, applications for future food and fiber research proposals are now being accepted on a rolling basis and are not subject to a deadline. The application is available on the NYS Department of Agriculture and Markets website.

This year, with the addition of the new research partners,

approximately 3,500 acres of New York farmland are approved for industrial hemp research trials, compared to 2,000 acres in 2017. Research projects will focus on utilizing industrial hemp as a source of food, fiber and grain for the production of animal bedding, insulation, pellets for heating and many other consumer products.

Researchers will also explore the potential cosmetic and wellness benefits of CBDs. They will also conduct biotechnology work and study indoor plant breeding and cloning methods as a possible source of transplantable plant stock for growers. Expanding the Industrial Hemp Agricultural Research Pilot Program will allow for more comprehensive studies on a wide range of topics and help New York secure its position as a national leader in the emerging industrial hemp industry.

Early Season Garlic Fertility

Crystal Stewart, CCE ENYCHP

The most important time to make nitrogen available to a garlic plant in order to increase yield is shortly after leaf emergence from the ground. Success in providing optimal nitrogen will depend on the nitrogen source you are using and some well-timed assistance from soil biology.

Remember that the nitrogen cycle is driven by biology, and biology is driven by temperature (and soil health!). Organic matter is decomposed partially into ammonium by a suite of microbes before nitrification (see Figure 1 for a handy visual). As the soil warms, N that is bound in organic matter (slow release N) will be made available, and ammonium nitrogen will turn to nitrate nitrogen (Figure 2), which is easily taken up by plants.

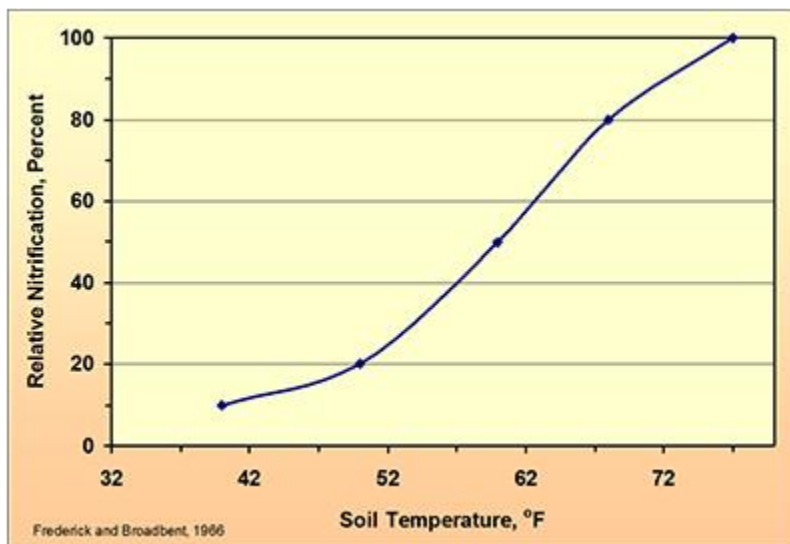


Figure 2: relationship of nitrification to soil temperature. As temperatures climb, nitrifying bacteria more quickly convert ammonia forms of N to nitrate forms, which are more plant available but also more prone to leaching.

Bare ground garlic growers can apply their nitrogen in the spring using a variety of sources including very soluble nitrate-nitrogen forms, because the plant will take up the fertilizer readily now. **Our latest research is showing that garlic needs no more than 50 lbs/A of N applied in a spring sidedressing.**

Nitrogen applied later in the growing cycle of garlic has very little if any effect on the final bulb size. So if you haven't applied your N yet, now is the time!

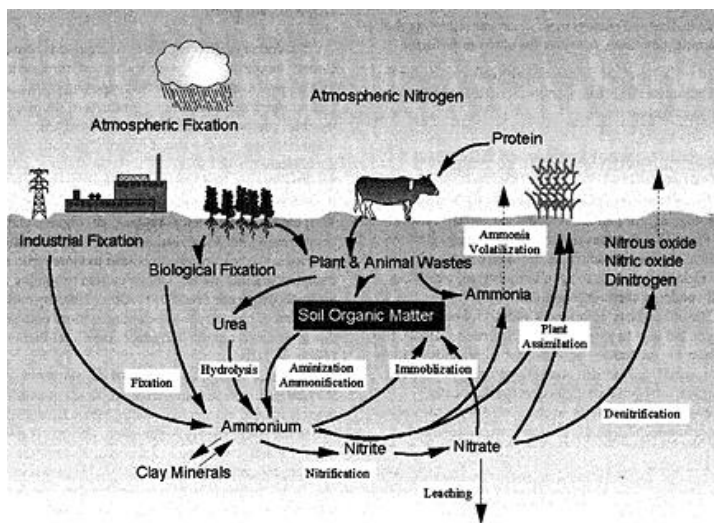


Figure 1: Nitrogen cycling, including organic and inorganic forms.

Save the Date!

July 12, 2018 – FSMA Training

Cornell Cooperative Extension, Albany County – Voorheesville, NY.

More information to follow. Questions? Call Laura McDermott, 518-746-2562

Get into eCommerce with FreshFoodNY!

Are you concerned that your farmers' market sales are flat? Have you thought of trying to bump up interest in current and prospective customers?

The Farmers' Market Federation of NY has found an excellent on-line app that will help you access the ecommerce marketplace. The technical support is high and the company, Crave Foods, is motivated.

This online farmers market, FreshFoodNY, supports convenience in shopping that shoppers want and combines that with the traditions of farmers markets. Shopping for local food is conveniently done through the FreshFoodNY app and is open 24/7. Farmers receive customer orders and brings the product to their farmers market for pick up. Of course, while at the market to pick up their prepaid orders, consumers are encouraged to shop the rest of the market.

Watch this video to learn more about FreshFoodNY, how it supports local farmers and food producers, while encouraging consumers to visit their local farms markets.

FreshFoodNY – Webinar Introduction

(<http://www.nyfarmersmarket.com/freshfoodny-introduction/>)

Participation of farmers and vendors is free, courtesy of the Farmers Market Federation of NY. This project also allows farmers that are not farmers market vendors to participate – it's an awesome opportunity for direct market farmers across the state!



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