Cornell Cooperative Extension | Cornell Vegetable Program

VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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Fall 2019 Vegetable Virus Update

Judson Reid, CCE Cornell Vegetable Program

The 2019 growing season wasn't the worse for virus diseases in vegetable crops, but we are still working on a few cases. The first we will mention is a virus of cucurbits, or vine crops: Zucchini Yellow Mosaic Virus (ZYMV). Growers reported stunting and distortion of leafs in July, with either malformed, or low-to-no fruit set in pumpkins. Cornell AgriTech Virologist Marc Fuchs has now confirmed this pumpkin tissue as infected with ZYMV. Virus are extremely small infectious agents that require a vector (or third party) for transportation. In the case of ZYMV it can be seed-borne, or spread in the field by aphids or tools. Given the high percentage of affected plants, we are now testing seed for ZYMV. Virus diseases cannot be controlled by fungicides, and once inside a plant, cannot be removed. Often people think that controlling aphids will stop virus. However, ZYMV is spread in a 'non-persistent' fashion by the aphid, meaning that transmission occurs quicker than we can expect insecticides to kill the aphid. This statement is not intended to give aphids a free-pass, rather highlight the futility of trying to turn a ZYMV infection around.

Figure 1. ZYMV on pumpkin. Foliage is stunted and malformed.
Photo: J. Reid, CCE CVP

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VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension partnership between Cornell University and CCE Associations in 14 counties.

The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

We're interested in your comments. Contact us at:
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Help us serve you better by telling us what you think. Email us at *cce-cvp@cornell.edu* or write to us at Cornell Vegetable Program, 480 North Main Street, Canandaigua, NY 14424.

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The next issue of VegEdge newsletter will be produced on November 4.

We have also observed ringspot symptoms in hot peppers, particularly open-pollinated varieties. These could be caused by Tomato Spotted Wilt Virus, Impatiens Necrotic Spot Virus or another altogether. Symptoms include black to purple discoloration of foliage, sometimes these lesions form perfect circular spots with green tissue in the center. Fruit can also exhibit ringspot symptoms to the point of being unmarketable. These 'Topso' viruses are common in bedding plants and can be spread to vegetable transplants by thrips.

Now is a good time to assess how virus diseases have affected your vegetable crops this season and make plans to reduce their negative impact in 2020.

- Look for varieties listed as resistant to viruses such as ZYMV.
- Buy certified seed from reputable companies with testing and quality control procedures.
- Have a weed control plan in place; to reduce the reservoir of virus and vectors between rows.
- Avoid mixing flowers and vegetable transplants in the greenhouse if possible.
- Manage thrips and other insects indoors.
- Implement sanitation SOPs for 'high-touch' crops like high tunnel tomatoes.
- Call the CVP for confirmation of suspected virus infected plants.
- Destroy plants suspected of virus infection.

Here's a ZYMV resource from Cornell Pathologist Emerita Tom Zitter: https://bit.ly/2mGesmk

Figure 2. ZYMV on pumpkin foliage. Raised warty areas on leaves can also be found on fruit. Total yield is greatly diminished. *Photo: J. Reid, CVP*

Figure 3. A potential 'Topso' virus producing symptoms on open pollinated hot pepper. *Photo: J. Reid, CCE CVP*

FARM FOOD SAFETY Updates

by Robert Hadad, CCE Cornell Vegetable Program

Webinar Series: Listeria Environmental Monitoring in Produce Facilities & Packing Houses

The Food Safety lab at Cornell University and the Strawn lab at Virginia Tech will be hosting a two-part webinar series entitled "Listeria Environmental Monitoring in Produce Facilities and Packing Houses." This series will demonstrate a Pathogen Environmental Monitoring (PEM) training workshop developed for produce facilities and packing houses and is complimentary for all participants (no pre-registration required).

Webinar 1: "FSMA and Listeria 101", Tuesday, October 8th, 1pm to 2pm EST
Join the webinar using the following link: https://cornell.zoom.us/j/606659500
Dial: 877 369 0926 US Toll-free Meeting ID: 606 659 500
Program: FSMA - Gretchen Wall (Produce Safety Alliance), and Listeria 101 - Alexandra Belias (Cornell food safety lab)

Webinar 2: "Listeria Environmental Monitoring Programs", Tuesday, October 15th, 1pm to 2pm EST
Join the webinar using the following link: https://cornell.zoom.us/j/924382320
Dial: 877 369 0926 US Toll-free Meeting ID: 924 382 320
Program: Listeria environmental monitoring - Laura Strawn (Virginia Tech) and Genevieve Sullivan (Cornell food safety lab)

Please direct questions to Alexandra Belias at amb629@cornell.edu

Sweet Potato Harvest and Storage

Ruth Hazard, UMass Extension

[We are starting to see more sweet potatoes being grown in WNY. Hopefully we will be able to establish a locally grown sweet potato slip production program here for next spring. Stay tuned for that. Here is a great article out of UMass on harvest and storage considerations. ed. R. Hadad, CVP]

Labor Day has passed, temperatures are dropping, and some growers have started harvesting sweet potatoes—must be almost fall. Sweet potatoes can be harvested whenever they reach a marketable size, but if you are looking to maximize yields, they should be dug as late as possible in the fall, according to research done by Becky Sideman at UNH Extension.

While vines can tolerate a light frost, the roots should come out before a hard freeze sets in. For more information on Becky's research, including a list of varieties trialed in New Hampshire, see the full reports: *Growing Sweet Potatoes in New Hampshire* and *Sweet potato early harvest study, 2014*. The storage needs of sweet potato differ from other common New England root crops. Once harvest is completed—generally by early to mid-October—curing and storage considerations continue to be important.

Harvesting. Sweet potato roots continue to grow until the leaves are killed by frost or until soil temperatures fall consistently below 65°F, whichever comes first. Check current soil temperatures here: http://newa.cornell.edu/index.php?page=soil-temperature-map .

Timing of harvest is often determined by digging up a few representative plants and assessing the percentage of roots in different size classes—the crop can be harvested whenever the majority of the roots are the desired size. If a hard frost occurs, the tops of the plants turn black. At that point, it is imperative to harvest as quickly as possible regardless of root size. Chilling injury can occur if soil temperatures drop to 55°F or below. It is also important to avoid holding sweet potatoes in saturated, low-oxygen soil conditions prior to harvest, as this promotes rapid decay in storage.

Take care when harvesting. Unlike tubers such as white potatoes, which form thickened, protective skins that bind tightly to the underlying tissue, sweet potatoes have thin skins that can be easily damaged by equipment or rough handling.

Curing. Any abrasions or wounds created at harvest can lead to rot in storage. Curing immediately after harvest is recommended when sweet potatoes will be held in storage for later sales. Curing minimizes damage and loss during storage by healing harvest wounds. During the curing process, a corky periderm layer is formed below damaged areas, which prevents invasion by pathogens and limits water loss. To cure sweet potatoes, keep roots at 82-86°F and high relative humidity (90-97% RH) for 4-7 days. Respiration rate is high during curing, so ventilation is important to remove CO2 and replenish O2. A greenhouse can provide good curing conditions.

A freshly harvested sweet potato is more starchy than it is sweet. During curing and storage, starches in the sweet potato are converted to sugars, improving flavor. The change in sugars is measurable within one week, but it is recommended to wait at least three weeks after harvest before consuming sweet potatoes to allow for more conversion of starches to sugars and maximum eating quality.

Storage. Sweet potatoes can maintain excellent quality for up to a year if proper storage conditions are achieved. The ideal storage conditions for sweet potato are the same as for winter squash; moderately warm (55-60°F) and 60-75% relative humidity. Like winter squash, sweet potato suffers chilling injury at temperatures below 55°F and injury increases with lower temperatures or longer periods of exposure. Signs of chilling injury include shriveled, sunken, dark areas on the tuber surface, and blackening of tubers when cut open. 'Hardcore' is a physiological disorder cause by chilling, in which areas of the tuber become hard—the condition is not apparent in fresh roots but appears after cooking. Because chilling injury is irreversible and makes tubers unmarketable, growers should take particular care to avoid field curing, or storage conditions that dip below 55°F.

2019 Elba Survey: EverGol Prime vs. Pro Go for Onion Smut Control

Christy Hoepting, CCE Cornell Vegetable Program

In 2019, thousands of acres of direct seeded onion acreage was grown from seed that was treated with EverGol Prime for the first time. It had been over a half century since a new fungicide for control of onion smut (Fig. 1) was registered and available for use in New York. EverGol Prime seed treatment with the active ingredient penflufen (FRAC 7) was the most effective active ingredient against onion smut that we had ever seen in over 20 field research trials of at least a dozen active ingredients. In Cornell studies, penflufen averaged 92% control (range: 82-100%) in seven field trials conducted in Elba (Hoepting, 2012, 2013, 2017). So, how did it do in 2019 in commercial production?

2019 Elba survey – Quick & dirty, few controls, no statistics. Since I was so excited about EverGol Prime and highly recommended it, I was really hoping that its performance in large-scale commercial production would live up to my hype. So, we did

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a "quick and dirty" survey in Elba muck in 2019. In total, we surveyed eight fields that were grown from Pro Gro treated seed and seven fields that were grown from EverGol Prime treated seed (Table 1). We surveyed fields belonging to four growers (A, B, C and D), which included six varieties. **In no situation did we have the same variety grown by the same grower in the same block with the only difference being Pro Gro vs. EverGol Prime (= no experimental controls).** There were many factors among our survey fields that could have also caused differences in onion smut. First, total seed treatment packages differed. Usually, the fields grown from Pro Gro treated seed was from seed that was left over from 2018 and was combined with FI500. Since, we also recommended that growers switch to Trigard for resistance management of onion maggot in 2019, seed that was treated with EverGol Prime was also typically treated with Trigard. But, we did have one survey field (Grower B BB-2 & 5) who used an EverGol Prime/ Trigard seed treatment combination (Table 1). Second, different growers used different planting equipment and drenches (Table 1). Third, planting dates and crop stage at time of assessment varied: Earlier planted fields that took longer to emerge could inherently have higher levels of onion smut. Finally, different blocks within the same farm and among different farms could have different inherent levels of onion smut.

We conducted the survey between July 1st and 11th when onions ranged from 4-5 leaf to 7-8 leaf per field (Table 1). In each field, we examined plants for onion smut: 20 samples of 20 consecutive plants in a row, which started with a smut-infested plant, for a total of 400 plants per field. If it took more than a couple minutes to find a smut-infested plant, we used a sample that started with a healthy plant. Using this method, our results are slightly skewed towards higher than actual incidences of onion smut. However, they are also skewed towards lower than actual incidences of onion smut, because several smut-infested plants could have died without a trace prior to early-July. **At the end of the day, this was not a scientific experiment. Thus, we can only report our findings as observations, not as statistically significant results.**

EverGol Prime did not disappoint – 2% onion smut
The seven fields treated with EverGol Prime (+ mancozeb in-furrow) resulted in an average of 2% onion smut (range: 1 to 3%) compared to the eight fields treated with Pro Gro, which averaged 15% onion smut (range: 7 to 21%). This represents an 87% reduction in incidence of onion smut (Table 1).

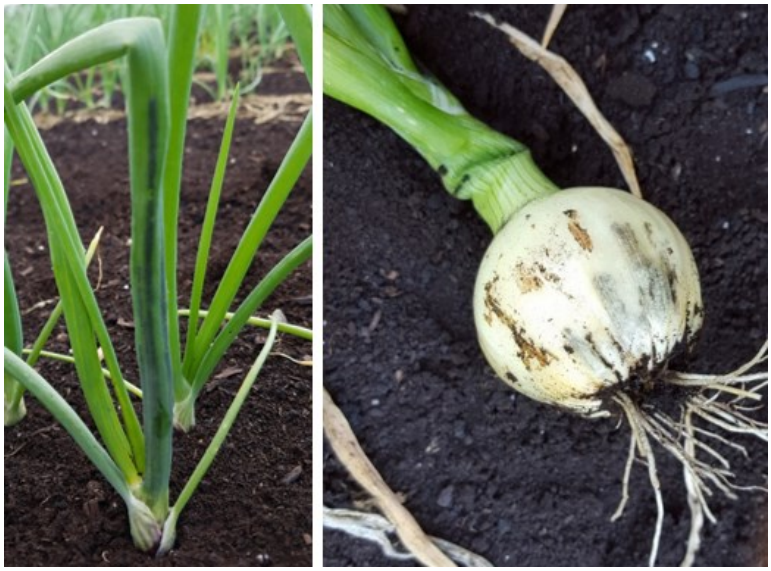

Figure 1. Dark pustules of onion smut spores inside leaves of onion seedling (left) and inside scales of immature bulb (right). Onion smut results in seedling mortality and unmarketable bulbs. It is a chronic problem in direct seeded onions grown in muck soils. *Photos: C. Hoepting, CCE CVP*

Doesn't 15% onion smut with Pro Gro seem high? As previously discussed, our incidence of onion smut is both higher and lower than the actual amount. In 11 small-plot research field trials conducted in Elba from 2002 to 2014, Pro Gro + mancozeb IF averaged only 59% control (range: 22-89%) where incidence of onion smut averaged 38% (range: 17 to 61%). Thus, 59% control of 38% would result in 22% onion smut. Also, slow onion growth during the cold wet spring of 2019 was favorable for onion smut as its incidence increases as the time from germination to maturity of flag leaf increases. Taking all this into consideration, 15% onion smut seems reasonable.

Other observations.

- Pro Gro alone generally does not provide adequate control of onion smut (average 38%; range: 0-76%, 15 trials), which is why mancozeb is applied in furrow in combination with Pro Gro treated seed. In 2016 trials, use of mancozeb in addition to EverGol Prime treated seed did not reduce onion smut beyond EverGol Prime alone. **In 2019, only one of the three growers who used EverGol Prime removed mancozeb from the drench** (Table 1 – Grower D). Levels of onion smut were as low in this field as they were in the others where EverGol Prime + mancozeb IF was used.
- However, chlorpyrifos (active ingredient in Lorsban) was used in-furrow in this field, which I found to provide some control of onion smut (e.g. ~20-30%) in my M.Sc. research. Interestingly, we also observed that of the Pro Gro + mancozeb treated fields, those without chlorpyrifos also had the highest levels of onion smut (Table 1 – Grower A KN-4 & 5).
- Grower D used only 50 GPA for in-furrow treatments compared to 100 GPA used by the other growers. In this case, when EverGol Prime is relied upon for onion smut control, reduced spray volume did not compromise onion smut control. We did not -collect any data on damping off or onion maggot control to know whether drench volume impacted control of these pests. **Reducing IF spray volume when seed treatments are expected to do the "heavy lifting" for onion smut, Damping Off and onion maggot may be entirely possible.**

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Reminder – EverGol Prime/Trigard do not provide Damping Off protection.

Pro Gro contains the active ingredient thiram, and FI500 contains the active ingredient mefanoxam, both of which along with mancozeb used IF have activity on Pythium species of damping off pathogens. So when Pro Gro + FI500 treated seed is used in combination with mancozeb in-furrow, essentially three active ingredients including a double application of mefanoxam with activity on damping off are applied. **Since the active ingredient in EverGol Prime does not have any activity on damping off pathogens and Trigard does not include a fungicide package, growers are encouraged to use mancozeb or mefanoxam (e.g. Ridomil) in-furrow for damping off protection when using these seed treatments.**

In our survey, Grower D field was the only one where two active ingredients were not used against damping off (mancozeb dropped). Although no data was collected on damping off in our survey, my general impression was that direct seeded onion stands were excellent in 2019, which exceeded my expectations given the cold soil conditions and delayed germination/emergence were seemingly favorable conditions for damping off. I also wonder how many young seedlings die "without a trace" from onion smut? At any rate, I am now under the impression that young seedling (loop-flag stages) mortality from heat and wind stress is much more detrimental in a hot spring than it is from damping off in a cold spring. **I suspect that when EverGol Prime + FI500 is used that only one (or none) active ingredient instead of two (macozeb + mefanoxam) are needed in the drench for damping off protection.**

Table 1. Field survey of Pro Gro and EverGol Prime seed treatments for control of onion smut, Elba Muck, Early-July 2019.

% Onion Smut[1]	Onion Smut Seed Treatment	Grower Code	Field Code[2]	Onion Variety	Other Seed Treatments		Drench Treatments		Drench Specs		Survey Sample	
					Fungicide	Insecticide	Fungicide(s)	Insecticide	GPA[3]	Band width (inch)	Date	Crop Stage
21	Pro Gro	Grower A	KN-5	Bradley	FI500 (mefanoxam axoystrobin, fludioxinil)	FI500 (spinosad, thiamethoxam)	mancozeb mefanoxam[4]	none	100	3	Jul 1	5-6 leaf
20	Pro Gro	Grower A	KN-4	Bradley	FI500 (mefanoxam axoystrobin, fludioxinil)	FI500 (spinosad, thiamethoxam)	mancozeb mefanoxam	none	100	3	Jul 1	5-6 leaf
17	Pro Gro	Grower B	30A-2	Red Wing	none	Trigard	mancozeb mefanoxam	chlorpyrifos	100	4	Jul 8	7-8 leaf, bulb swell
14	Pro Gro	Grower B	BB-9	Safrane	none	Trigard	mancozeb mefanoxam	chlorpyrifos	100	4	Jul 8	6-leaf
7	Pro Gro	Grower B	D-1	Safrane	none	Trigard	mancozeb mefanoxam	chlorpyrifos	100	4	Jul 11	6-leaf, 1" bulb
12	Pro Gro	Grower C	E	Montclair	FI500 (mefanoxam axoystrobin, fludioxinil)	FI500 (spinosad, thiamethoxam)	mancozeb	chlorpyrifos	NA[5]	NA	Jul 11	4-5 leaf
13	Pro Gro	Grower C	FE	NA	FI500 (mefanoxam axoystrobin, fludioxinil)	FI500 (spinosad, thiamethoxam)	mancozeb	chlorpyrifos	NA	NA	Jul 11	4-5 leaf
15%	AVERAGE											

% Onion Smut[1]	Onion Smut Seed Treatment	Grower Code	Field Code[2]	Onion Variety	Other Seed Treatments		Drench Treatments		Drench Specs		Survey Sample	
					Fungicide	Insecticide	Fungicide(s)	Insecticide	GPA[3]	Band width (inch)	Date	Crop Stage
2	EverGol Prime	Grower A	KN-1	Safrane	none	Trigard	mancozeb mefanoxam	none	100	3	Jul 1	5-6 leaf
2	EverGol Prime	Grower A	KN-2	Safrane	none	Trigard	mancozeb mefanoxam	none	100	3	Jul 1	5-6 leaf
2	EverGol Prime	Grower B	BB-2	Montclair	none	Trigard	mancozeb mefanoxam	chlorpyrifos	100	4	Jul 8	5-leaf
3	EverGol Prime	Grower B	BB-5	Montclair	none	Trigard	mancozeb mefanoxam	chlorpyrifos	100	4	Jul 8	5-leaf
2	EverGol Prime	Grower D	30A-S	Oreus	none	Trigard	mefanoxam	chlorpyrifos	50	0.25	Jul 11	4-5 leaf
1	EverGol Prime	Grower D	30A-M	Morpheus	none	Trigard	mefanoxam	chlorpyrifos	50	0.25	Jul 11	5-leaf
2%	AVERAGE											

[1]**% Onion Smut:** average of 20 sub-samples of 20 consecutive plants per field (= 400 plants/field).
[2]**Field Code:** Fields with the same first part of field code (e.g. KN or BB, etc.) per grower are from the same block, where comparisons in side-by-side fields were made.
[3]**GPA:** gallons per acre.
[4]**Mefanoxam** is the active ingredient in Ridomil.
[5]**NA:** Not available.

Yellow highlights: Active ingredient has "some" activity on onion smut. Mancozeb is in Manzate Max, Roper, etc. Chlorpyrifos is in Lorsban, Hatchet, etc.
Blue highlights: Active ingredient has "some" activity on damping off Pythium spp.

Upcoming Events

view all Cornell Vegetable Program upcoming events at CVP.CCE.CORNELL.EDU

FSMA Regulations for Small and Very Small Food Processors

October 25, 2019 (Friday) | 8:30am - 4:30pm
Cornell AgriTech, Food Research Lab, Rm G34, 665 W North St, Geneva, NY 14456

Did you know that the new federal regulations for small food processors under the Food Safety Modernization Act (FSMA) are in effect as of September 2018? Do you know what is required of you or your facility as a New York State food manufacturer? During this one-day introductory course, the experts at Cornell's Food Venture Center will explain the new food safety exemption requirements for Small Businesses. Get the information and tools you need to make your operation comply with the FDA rules for selling safe products to the public. Registration space is limited to 24 attendees. The cost to register is $25/person. Deadline to register is Friday, October 18, 2019. More information and links to registration and payment can be found at http://events.cornell.edu/event/fsma_regulations_for_small_and_very_small_food_processors or contact Sarah Lincoln at 315-787-2255, sjl38@cornell.edu

Tarping for Reduced Tillage in Small-Scale Vegetable Systems

November 18, 2019 (Monday) | 9:00am - 4:00pm
CCE Ontario County, 480 N Main St, Canandaigua, NY 14424

Are you a vegetable farmer already using tarps? Or are you wondering if and how tarps could work best on your farm? Tarping has emerged as a new practice for small farms – a tool being used to suppress weeds, manage soils, and reduce our tillage. Join a full-day intensive farmer-to-farmer workshop to talk about how we can use tarps to advance reduced and no-till vegetable production. Hear about tarping successes and failures as we discuss tillage, weeds and how to combine tarps with other soil building practices, like compost, mulches, and cover crops. Come to learn research results from 5 years of tarping trials in ME and NY, share your own tarping experiences and issues, and walk away with a plan to use tarps with less tillage on your farm.

This is participatory workshop designed for farmers to learn from other farmers. Come prepared to dig-in, share your practices and struggles, and bring your questions as you consider adopting, changing, or expanding tarping practices on your farm. Workshop led by Crystal Stewart, CCE ENY Commercial Horticulture Program; Ryan Maher and Anu Rangarajan, Cornell Small Farms Program; Mark Hutton and Nick Rowley, University of Maine and UME Cooperative Extension.
Cost to participate is $35 per person with lunch and refreshments provided. Registration opens soon!

For questions on registration and workshops, contact Ryan Maher, rmm325@cornell.edu. Support provided by Northeast SARE Research and Education Grant # and Federal Capacity Funds – Smith Lever/Hatch

Processing Vegetable Crops Advisory Meeting

December 17, 2019 (Tuesday)
First United Methodist Church, 8221 Lewiston Rd. (Route 63), Batavia, NY 14020

9:30 AM – 12:10 PM Beans and Sweet Corn
12:15 PM – 1:00 PM Complimentary Lunch
1:00 PM – 2:00 PM Peas
2:00 PM – 3:30 PM Carrots and Beets

All are invited to attend and discuss the 2019 season for each crop, meet the new Cornell Weed Scientist and discuss weed management concerns, and receive updates on research conducted during 2019. Separate DEC and CCA credits will be available for each of the 3 crop meetings. The meeting is free of charge and there is no registration required. Questions? Contact Julie Kikkert, 585-313-8160.

Hemp Issues Round Up

Elizabeth Buck, CCE Cornell Vegetable Program

Hemp cropped up on several vegetable farms this year. That's not surprising, as it takes well to vegetable-style cultivation and can act as a high-value rotational crop. Since everyone is working to learn this new crop, here's a little compilation of issues seen in 2019 crops.

Hemp has male and female plants. The circled area shows male flowers. Occasionally plants will produce both male and female flowers. When raising hemp for CBD, the males must be removed from the field to prevent pollination and seed set. Fields need to be walked frequently leading up to flowering to identify and remove male plants.
Photo: E. Buck, CCE CVP

This is Hemp Bipolaris, which is caused by a *Bipolaris* genus fungus. It begins as small necrotic flecks. There is a dark border on the edge of the necrotic tissue, surrounded by a lighter colored halo. As the disease progresses, the entire lesion becomes dark colored.

Bipolaris is a serious blight of hemp in areas with slightly warmer and more humid summers. Crops in Tennesee and Kentucky have been lost in as little as 3 weeks.

Thankfully, Bipolaris is not as aggressive in NY. While it does spread readily with wet conditions, we don't seem to have the level of heat and humidity that drives severe outbreaks.

So far, Bipolaris seems to show up in later summer – generally corresponding with hot days and dewy nights. Foggy areas could have more of a problem with this disease. Bipolaris is a rugged pathogen that is expected to overwinter very well on crop debris. *Photo: Kevin Myers, Cornell*

This is Zonate Leaf Spot caused by the fungus *Cristulariella moricola*. It starts off as small, light colored necrotic flecks surrounded by chlorotic tissue (right side of photo). Lesions enlarge and develop the characteristic light colored rings (left side of photo). Not much is well understood about this pathogen, or its dynamics in hemp. It can be a problem in ornamental production and will naturally attack many native trees and shrubs, including several maple species.
Photo: Kevin Myers, Cornell

This is generalized insect feeding. In addition to this foliar feeding, hemp can be attacked by European Corn Borer. The European Corn Borer can drill directly into stems and branches, which opens up wounds for secondary fungal decay. *Photo: Kevin Myers, Cornell*

Crops raised indoors are susceptible to nutrient deficiencies and salt burn. At left, a calcium deficiency causes generalized yellowing and necrotic, irregularly shaped brown spots between the veins. At right, excessively high salts in the growing media causes salt burn, a yellowing followed by necrosis along leaf margins. *Photo: E. Buck, CVP*

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This is a plant with root and crown rot. The large plant wilts and yellows as it comes under stress and as the disease progresses. Flowering and maturity, as well as any other stress (drought, drowning, nutrition, etc) will cause the symptoms to become more pronounced. One causal organism of such rots is the common, soil-borne fungus Fusarium. *Photos: E. Buck, CVP*

White mold can also attack hemp. Unfortunately, I don't have a photo to share. Most often, white mold will cause one branch or one part of a branch to wilt, yellow, and collapse. Some plants may go down at the crown. If split open, an infected branch will be full of white mold and may also contain the hard, black, overwintering sclerotia. Hemp can be a good rotational crop for many vegetable diseases, but should not be planted in fields with a history of white mold.

Powdery mildew is a foliar disease of hemp. Like other powdery mildews, it produces characteristic white, confectionary sugar-like spots on the foliage. *Photo: E. Buck, CVP*

There is nothing wrong with this plant! This is (in my opinion) a very beautiful chimera, or variegation, that naturally arose on one branch of the plant. Fun fact, there are three layers of plant tissue that contribute to the green color. The depth of green is related to which layer and how many layers lost their pigmentation. That's why there's dark green, medium green, pale (almost white) green, and yellow tissues in this pretty plant. Unfortunately, variegated leaves are usually less efficient at making sugar and therefore plants with a lot of variegation likely have lower growth rates and yield potential. *Photo: E. Buck, CVP*

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Cornell Vegetable Program

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VegEdge is the award-winning newsletter produced by the Cornell Vegetable Program. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.

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