Cornell Cooperative Extension | Cornell Vegetable Program

VEGEdge

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Hazardous Algae Blooms and Irrigation Ponds

Lisa McKeag, UMass Extension Vegetable Program; original 'Algae in Irrigation Water', Vegetable Notes, 8/4/2022

[This summer has been a tough one when it comes to Hazardous Algal Blooms (HABs) here in NY State. Besides recreational waterways, irrigation ponds have really been impacted a lot of rainfall (causing runoff into ponds etc.) and high temperatures. Pond weed is always commonplace, but algae blooms are also showing up. From a food safety perspective, algae contamination hasn't been on our radar until news of blue-green algae showing up in some NY ponds. Digging further into algae, it became apparent that ***surface water with algae present does, in fact, pose a health threat if applied as irrigation to produce in the field****. HABs can also* ***pose a danger to anyone encountering contaminated water and this includes being close enough to breathe in toxins in the air around the waterways. Thinking about irrigation intake pipes, header lines, and moving sprinklers, farmers and workers could easily come into contact with the algae.*** *We have reached out to FDA for guidance but, in the meantime, NY DEC has some information useful for growers: https://www.dec.ny.gov/chemical/77118.html, phone: 518-402-8179, HABsinfo@dec.ny.gov. Our colleagues with UMass Extension put out an article two years ago and what they presented bears repeating here. – ed. R. Hadad, CVP]*

The conditions of this summer—hot and dry—are especially conducive to the build-up of excessive algae in surface waters. While algae is normal and even beneficial (it contributes oxygen to the atmosphere), too much algae in farm ponds or reservoirs used for irrigation can clog irrigation equipment and contribute to the accumulation of muck that can trap plant and human pathogens. Algae are aquatic plants that need the same nutrients that crop plants do, so when nutrients—especially nitrogen and phosphorus, often from fertilizer applications or manure runoff—accumulate in the water, algae proliferate. The best ways to prevent problems from algae are to 1) prevent excessive growth by reducing the nutrients that run-off into the water from field applications, 2) create vegetative buffers

In this photo, the grower is managing an irrigation pond using blue pond dye and beneficial bacteria to reduce algal blooms from occurring. You can plainly see the bluish hue to the water and lack of algae scum on the surface. *Photo: UMass Extension*

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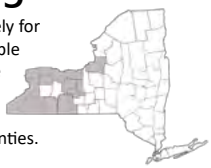

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The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

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The next issue of VegEdge will be produced on August 14, 2024.

ATTENTION: EMERGENCY STOP USE Order Issued for DCPA (active ingredient in DACTHAL)

US Environmental Protection Agency; edited by Elizabeth Buck, CCE Cornell Vegetable Program, and Lynn Sosnoskie, Cornell

The EPA has pulled all registrations for the herbicide DCPA (the active ingredient in DACTHAL, manufactured by AMVAC) and ordered that it no longer be used in any agricultural or non-agricultural setting, effective immediately. The EPA has found that "levels of DCPA in a treated field remain at unsafe levels for 25 days or more", far beyond the label specified REI of 12 hours. The EPA has also determined that there are serious "health risks associated with DCPA use and application, even when personal protective equipment and engineering controls are used. The most serious risks are to the unborn babies of pregnant individuals." With the emergency order, all sales are also suspended.

Dacthal was previously labelled for use in broccoli, brussels sprouts, cauliflower, cabbage, leafy brassicas, collards, kale, mustard greens, turnips, broccoli raab, onions, radish, sweet potato, tomato, tomatillo, eggplant, horseradish, strawberries, and turf. **DO NOT continue to apply Dacthal.**

See the full 8/6/24 press release at EPA Issues Emergency Order to Stop Use of Pesticide Dacthal to Address Serious Health Risk, https://www.epa.gov/newsreleases/epa-issues-emergency-order-stop-use-pesticide-dacthal-address-serious-health-risk-4

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around ponds to filter out nutrient runoff from produce production areas or from manure runoff, 3) avoid addition of leaves or grass clippings to water, and 4) aerate the water to increase oxygen levels and increase the levels of anaerobic bacteria that feed on organic matter and help reduce nutrients. See this Purdue Extension fact sheet for more info on managing algae in irrigation ponds.

Another important reason to pay attention to algae is that some species produce substances that can be toxic to humans and animals. Toxic algae may become dominant in stagnant water, especially during periods of drought and high temperatures. These Harmful Algal Blooms (HABs) made up of cyanobacteria (sometimes called blue-green algae) can make people and animals sick when they ingest, or inhale affected water. Typically, cyanobacteria will look like a blue or green mat or scum on the surface of the water. If you see these concerning signs in your irrigation water sources, avoid contacting the water, don't allow pets or livestock to drink from it, and don't allow the water to directly contact the edible portions of food crops. Avoid using algaecides since the toxins are contained within algal cells and are released when cells die.

Sweet Corn Pheromone Trap Network Report

Marion Zuefle, NYS IPM, 8/6/24

Statewide, 30 sites reporting this week (see trap count table). European corn borer (ECB)-E was trapped at 5 sites and ECB-Z was trapped at 10 sites. Corn earworm (CEW) was trapped at 20 sites, with 14 sites high enough to be on a 4, 5 or 6-day spray schedule (see chart). Fall armyworm (FAW) was caught at 5 sites and Western bean cutworm (WBC) was caught at 26 of the reporting sites.

Often at this time of year we are catching CEW at most locations and in high enough numbers that other moths will be controlled by the spray timing needed for CEW. In the absence of CEW, continue to scout for ECB egg masses, and ECB and FAW larvae and feeding damage, using a threshold of 15% infested plants in tassel emergence stage fields and 5% in silk stage fields.

European Corn Borer and Bacterial Soft Rot in Peppers

Elizabeth Buck, Cornell Cooperative Extension, Cornell Vegetable Program

While European corn borer is primarily a sweet corn pest, it does attack peppers every year. Corn borer damage causes losses on a number of farms and creates opportunity for secondary bacterial infections.

What does the damage look like?

European corn borer larvae are caterpillars that make their way down to the fruit almost immediately after hatching and drill into fruit. Young fruit are most susceptible – caterpillars prefer walnut sized and smaller peppers. Entry holes are usually above the shoulder and often are located very close to or under the calyx.

The caterpillar will feed inside the pepper fruit for at least a week. How long it feeds inside the pepper depends on ambient temperature during the feeding period. Immature caterpillars may be present inside the fruit and can sometimes be heard rattling around if you shake a suspicious pepper. Mature larvae drill a second hole to exit the pepper, often located low on the side wall or through the bottom.

ECB damage to pepper. *Photo: Judson Reid, CCE Cornell Vegetable Program*

Management of the European Corn Borer

European corn borers are fairly easy to scout for in peppers. Their eggs look like pale patches of fish scales and are laid on the bottom of pepper leaves near the central vein. Eggs take 4-9 days to hatch, depending on the ambient temperature. Because eggs can take as little as 4 days to hatch, once a week scouting is insufficient to prevent damage. Eggs that have a dark spot in them are going to hatch within the next day. Mark plants with egg masses (a piece of bright duct tape on a leaf works well) to re-check daily so you can catch when the eggs change color. It is the change in egg appearance that allows you to accurately time your sprays.

In all cases, you want to **time your sprays for just after hatch**. Sprays are ineffective once the caterpillars enter the pepper. Again, the caterpillars are most attracted to the younger, walnut sized and smaller fruit. Since the undersides of leaves are an exceedingly difficult spray target, try your best to get coverage of smaller fruit.

In pepper, European corn borer can be treated with a number of pyrethroids (Hero, Gladiator, Leverage, Mustang Maxx, Warrior, etc), Group 28 materials (Coragen, Exirel, Minecto Pro), spinosyn materials from Group 5 (Radiant and Entrust), and the Group 22A material Avaunt eVo. Pyrethroids require a spray license and generally have a 7 day pre-harvest interval (PHI). Pyrethroids are also harsh on beneficials and can disrupt naturally occurring biocontrol of thrips, aphids, and spider mites. The Group 28s

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have a shorter 1 day PHI but also require a spray license in NY and some growers feel these chemistries have a high price point. Avaunt eVo has a 3 day PHI and does not require a license, but can only be used in bell pepper. That leaves the **spinosyn class Group 5 materials Entrust (organic) and Radiant. Both materials have a 1 day PHI, do not require a license, and both can be used on wide variety of peppers.**

Organic growers may try using Bt products in addition or rotation with Entrust. There will be some suppression from natural enemies and generalist predators like lady beetle larvae, lacewings, minute pirate bugs, and parasitoids. I think it is risky to solely rely upon generalists to provide control if you are finding multiple egg masses while scouting.

Monitoring for European Corn Borer

We monitor for European Corn Borer through the sweet corn pheromone trap network. Risk to peppers increases when European corn borer adults are active in your area. Once adult flight activity picks up growers should start scouting their peppers for egg masses and continue scouting twice weekly for about 3 weeks. You have to scout twice a week because eggs can hatch in only 4 days in warm weather. If you miss the hatch, you'll have a difficulty timing your spray and control could be lack luster.

I acknowledge that for a variety of reasons, watching the sweet corn trap network catch counts is an imperfect tool. We keep one set of traps per county (for most counties in WNY) and the corn borer activity in that area against corn won't necessarily reflect pressure in your area. Sometimes we see corn borer damage in peppers with low or no trap catches in the sweet corn traps.

A handful of growers have started keeping their own corn borer traps on their pepper fields. It costs about $110 to purchase a trap and 10 lures (enough for 1-2 seasons). There are 2 kinds of corn borers, so all in cost to get set up is about $225 without shipping. The traps last about 5 years if cared for properly (cleaned at end of season, stored away from mice). Annual cost for lures is $20-25. Economically, the investment and cost of trapping is about equal to the cost of 1 spray when you include labor, material, and associated application costs. An easy offset if it helps you get away from calendar spraying. Reach out to your local specialist if you want to learn more about trapping on your farm.

What else contributes to elevated risk?

Corn borers prefer to lay eggs in corn. They are picky about staging, though. They want to lay eggs on whorl stage corn and don't bother corn very much after tasseling. If the European corn borer cannot find corn of a suitable stage, they will look for other host plants. This means that pepper plantings are at higher risk when surrounding cornfields have outgrown the whorl stage and are no longer attractive to the moths. This includes both field corn and sweet corn, whichever is predominate in your surrounding area. The size of the corn borer population contributes to risk, too. More corn borers out there flying around, the greater pressure and generally more problems we see in peppers. The race E corn borers have 2 generations. If the first generation is poorly controlled then we are at greater risk for damage from the second generation.

Secondary Bacterial Soft Rot

Unfortunately, the most unsavory part of a corn borer infestation is not the caterpillar in your pepper. It is the unpleasant bacterial soft rot that follows. **The bacterial soft rot that often comes in secondary to a European corn borer problem can become the primary cause of loss within the field.**

Bacterial soft rots enter the pepper through the entry wound and causes mushiness. The rot can progress quickly and will start to liquify portions of the pepper. There can be a nasty bacterial soup inside the fruit. Eventually fruit with bacterial soft rot will fall off the plant. You can also experience post-harvest losses as some fruit that seem alright at picking may develop soft rot during storage.

The bacterial soft rot problem deserves attention. In dense canopies and under favorable weather conditions (wet, warm), the bacterial soft rot can start spreading to healthy fruit. It is easily spread: from dripping rotting fruit, splashing water, and on the hands and clothing of workers and equipment. Soft rot is putrid, disgusting, and not easy to stop once it takes off.

Managing Bacterial Soft Rot

Unfortunately, **there is little that can be done to manage the problem by spraying**. Copper is the go-to material for bacteria, but it cannot stop an already active infection and it cannot touch a problem inside the fruit. Copper isn't going to save the day.

Cultural controls provide better odds of success. First off, scout for ECB egg masses and manage corn borers well to prevent wounding. Next, make sure there is good airflow in your canopy to allow the dew and rainfall to dry out quickly. Remove weeds and consider whether your plant spacing might be too tight. Stake plants that insist on falling over on one another.

The best thing to do is to remove any ECB damaged fruit and any fruit with any softness early and often. Peppers will continue to invest in a damaged fruit until it falls off from the plant on its own. The energetic investment in damaged fruit is a waste. Removing damaged fruit allows the crop to focus all its resources on maturing marketable fruit. Early and frequent removal limits the amount of wasted energy and also reduces the amount of time that bacterial soup that can develop and spread within the canopy which should limit the overall quantity of nastiness. Be suspicious of fruit that seem to be ripening too early or unevenly, they are often damaged. Because the bacteria will splash back up onto the plants in the rain, it is better to remove the soft rot fruit from the field, if possible. It is also a good practice for workers to carry Clorox wipes or rubbing alcohol to frequently wipe down their hands when they are working through a canopy with a bacterial soft rot problem.

CROP Insights

Observations from the Field and Research-Based Recommendations

GENERAL

Heavy rains continue to cause localized problems: elevated disease risk/presence, inability to make timely field operations leading to out-of-hand insect and weed issues, partially drowned sections of fields, loss of fertility due to leaching, soil erosion. Compaction builds as growers try to work through wet fields with harvest support equipment. – EB

BEETS

Although Cercospora leaf spot (CLS) is the most common foliar disease of table beets, other diseases contribute to the leaf disease complex that can weaken or defoliate the crop. The rotation of fungicide chemistries can help to manage these multiple diseases because products have different efficacies on different pathogens. Alternaria leaf spot (ALS) is caused by fungi belonging to the Alternaria genus. ALS is favored by temperatures in the range of 60 to 78°F and high humidity. Therefore, this disease is mainly observed on mature plants in late summer or early fall when the temperature begins to drop. Symptoms begin in the lower and older leaves as tiny, pinhead like spots which can expand to form dark patches. Phoma leaf spot (PLS) and root rot is caused by the fungus, *Phoma betae*. Foliar symptoms include tan-brown lesions with dark concentric rings in leaves and petioles. The disease may also affect the roots during post-harvest storage. If bacterial leaf spot (BLS) was present early in the season, the disease may still be present in the field, further confusing leaf spot identification. For more information on these diseases, see the table beet factsheets at https://www.vegetables.cornell.edu/pest-management/disease-factsheets/ – JK

CARROTS

Root-knot nematodes (*Meloidogyne* spp.) are a major pathogen of carrots, lettuce, and onions in New York. The Northern Root Knot Nematode (NRKN) has a host range of more than 550 crop and weed species. It can survive extremely low winter temperatures such as occur in New York. In carrots, take note of patchy growth in fields. Severely infected roots exhibit forking, galls, hairiness, and stubby roots. Note that forking can also be caused by other soil borne pathogens or compacted soil, however in these cases, no galls will be present on the taproot or fibrous roots. Crop rotation to non-host crops such as sweet corn and other grain crops can significantly reduce the population of NRKN in a field. Winter grain cover crops such as winter rye and oat are poor hosts for NRKN. Other grain and biofumigant cover crops may also reduce NRKN populations. A lettuce bioassay procedure is available to assess the population of NRKN in soils https://ecommons.cornell.edu/handle/1813/43295 – JK

COLE CROPS

Seeing alternaria in some cauliflower. This is good white mold weather; be proactive if you have a field history of the disease. – EB

DRY BEANS

Root rot and white mold are showing up in many fields this week. Wet weather brought on by recent storm systems will contribute to both. Mexican bean beetles (MBB) are active in many fields. Be sure to monitor for thresholds, as MBB can quickly defoliate plants and cause direct damage to pods. Japanese beetles have also been seen chewing on dry bean foliage this week. – ML

Western Bean Cutworm Report

Western bean cutworm trapping continues at 16 locations in the region (Table 1). All locations have now reached peak flight, and numbers are quickly decreasing. Overall moth numbers appear to be higher this year compared to recent years.

Now that peak flight and thresholds have been met, scouting should begin in dry beans. To scout for WBC, inspect 50 plants per field (10 stops, 5 plants per stop), looking at all pods present on the plant for holes. WBC

Table 1. Western bean cutworm adult moth numbers by date for each dry bean trap location. Red text indicates peak flight.

Dry Bean Location	July 2	July 9	July 16	July 23	July 30	Aug 6	Cumulative Moths
Avoca Hill East (Steuben Co.)	0	0	38	284	209	41	**572**
Avoca Hill West (Steuben Co.)	1	5	23	29	8	4	**70**
Avoca Valley (Steuben Co.)	0	1	27	56	29	8	**121**
Caledonia (Livingston Co.)	3	23	29	66	160	38	**319**
Churchville (Monroe Co.)	5	45	70	57	125	52	**354**
East Bethany (Genesee Co.)	NA	7	82	96	102	28	**315**
LeRoy (Genesee Co.)	NA	7	101	244	210	85	**647**
North Chili (Monroe Co.)	1	0	11	16	34	28	**90**
Pavilion (Genesee Co.)	1	7	53	97	82	54	**294**
Penfield (Monroe Co.)	NA	7	33	99	131	72	**342**
Penn Yan North (Yates Co.)	NA	4	4	76	18	9	**111**
Penn Yan South (Yates Co.)	NA	3	3	118	61	12	**197**
Scottsville (Monroe Co.)	0	4	14	41	89	12	**160**
Wayland Hill (Steuben Co.)	0	13	45	124	167	99	**448**
Wayland Valley (Steuben Co.)	3	2	10	96	82	27	**220**
Wyoming (Wyoming Co.)	11	77	82	135	92	59	**456**

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chew directly into the pod and eat the seed. It can be difficult to scout dry beans for egg masses or caterpillars, since the caterpillars move from the pods to the soil during the daytime, so looking for signs of damage is the best strategy. European corn borer damage (ECB) may be similar to WBC, but an ECB larva would likely still be present in the pod when inspected. If damage into the pod and seed is found with no larva present, it is possible this is WBC. An insecticide application is recommended if dry bean pod damage is found.

ONIONS

Onions are bulbing nicely! And the growing season is finishing quickly. Most direct seeded fields have 2-2.5 inch bulbs and are starting to lodge. Last week on August 1st, the record was broken for earliest application of sprout inhibitor for storage-bound onions in an early-maturing variety in Oswego. **Disease pressure remained low** this past week in the onion scouting fields with Botrytis leaf blight (BLB) halo lesions being less than 1 halo/leaf, BLB necrotic spots being 7-23 spots/leaf in Elba and less than 5 spots/leaf in Wayne and Oswego Cos., and Stemphylium leaf blight (SLB) being mostly secondary (SLB) with only 0-23% of plants having primary SLB (target spots on green tissue). Fungicide sprays applied last week were mostly Bravo (FRAC M5) + FRAC P07 (e.g. Rampart, Reveille) and Viathon (FRAC 3c + P07) + Tilt (FRAC 3a). All fungicide spray programs are including FRAC P07 to prevent leaf dieback/keep foliage green from now until the finish. Onion thrips are finally under control across the region.

Two weeks ago, we observed a **mysterious burn extending from the leaf tips** in some of our scouting fields in Oswego (Fig. 1A). The burn appeared as a white narrow necrotic streak that extended from the leaf tip as far as the mid-leaf. It occurred predominantly on the south-facing side of the plants and only on a middle-aged leaf, while the oldest leaves and youngest leaves were fine. At the same time, the same phenomenon was observed in Holland Marsh in Ontario, Canada. It is thought that the sun burned the tender leaves just as they had emerged from the leaf sheath about 3 weeks prior when the UV index was very high (e.g. 9 out of 11) around July 2. Now, SLB has begun to colonize the necrotic burned leaf tissue as a secondary pathogen (Fig. 1B). For the most part, SLB should remain secondary in this situation.

Figure 1. Sunburn on south-facing side of middle-aged onion leaves (A) is now being invaded by Stemphylium leaf blight (B) as a secondary pathogen. *Photo A: C. Hoepting, CVP. Photo B: Shawn Janse, Muck Crops Research Station in Holland Marsh, Ontario, Canada*

The cooler temperatures this week will be good for onion growth, but also more favorable for downy mildew (DM). Onion DM is favored by cool temperatures (less than 72˚F) and wet conditions, especially when there is heavy dew at night. Spores are produced at night and are easily blown long distances in moist air. They can germinate on onion tissue in 1.5 to 7 hours when temperatures are 50 to 54 ˚F. High daytime temperatures (> 74˚F) and short or interrupted periods of humidity at night can prevent sporulation. Therefore, DM is typically of most concern in onions once the heat wave of summertime passes and when cool nights and heavy dews are common. DM-infected plants are quickly invaded by SLB, and when conditions are favorable, a DM-SLB complex may defoliate an onion crop in just 2 weeks. **Be on the lookout for DM when scouting from now until the end of the season (Fig. 2).** FRAC M3 (mancozeb) and FRAC P07 (Reveille, Rampart, etc.) are most commonly used for protection against DM, but FRAC 29 (Omego) and 11 (Quadris/Aframe) also have activity. – CH

Figure 2. One to three week old downy mildew in onion. A) Young 1-week old downy mildew usually occurs on the middle-aged leaves. It causes the leaf tissue to turn pale and sometimes yellowish in elongated patches. Look for grayish-purple fuzzy growth (spores) on green leaf tissue. B) 2-week old downy mildew has necrotic spots where the pathogen killed the green tissue, which is being invaded by Stemphylium leaf blight (tan, black and purple target spots). Look for purplish fuzzy sporulation growing on the necrotic spots and surrounding green tissue. C) 3-4 week old lesions have no more green tissue left and are over run with black SLB spores. Look for fuzzy remnants of DM spores on the infected area. *Photos: C. Hoepting, CVP*

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POTATOES

Colorado potato beetles remain active in some fields. Storms moving through western NY continue to bring risk of spread of late blight, so it is important to stay consistent with fungicide sprays through the end of the season. No new late blight has been reported this week. – ML

SNAP BEANS

Mid-August through September presents the highest risk period for white and gray mold in snap beans because of prolonged wetness in the plant canopies and morning dews. Fields with a history of Sclerotinia white mold and with dense canopies are most at risk for developing white mold. Rainy weather is highly favorable! Flowers become infected and disease spreads to the rest of the plant. A first fungicide should be applied to fields at risk when there is an average of 1 open flower/plant in 10% of the plants; a second application may be considered at 100% bloom (this may happen within a day or two in some varieties in warm weather). Research in the Pethybridge group at Cornell focused on the products Endura, Topsin 4.5 FL, and Omega 500F. Each of these products is highly efficacious when applied at optimal timing and there was no significant difference in the disease control between the products. In further teasing out the optimal application timings, our research has shown that the optimal timing of Topsin 4.5 FL is at 10% bloom, and that this product is not effective when applied at 100% bloom. Furthermore, there is no benefit to a second application. Conversely, disease control with Omega 500F was not related to timing (10% or 100% bloom) and there was no benefit from a second application even when applied at 100% bloom. For growers who were not able to put on a spray at 10%, then Omega 500F would be the choice product to use. The timing of the other possible fungicides was not tested. For organic growers, the most efficacious and reliable product from year to year is Double Nickel (*Bacillus amyloliquefaciens* strain D747). Both the LC and 55 formulations are equally effective. While labeled at the rate of 1 to 2 quart/acre, there was no benefit of the higher rate, and thus 1 quart/acre is recommended. – JK

SQUASH

The appropriately named Squash Bug is causing widespread damage to squash and other vine crops across the region this week. Scout for egg masses and consider an insecticide application once nymphs have hatched. These nymphs are green to gray and feed in groups on leaves and stems (Fig. 3). They do not resemble adults, which are more solitary and often hide beneath plastic mulch. Cornell Guidelines indicate that Pyganic is an organic (OMRI listed) material that can control nymphs if sprayed weekly or more often. Nymph stage is the moment to control them as the adults are much more difficult to target. – JR

Figure 3. Squash Bug nymphs are green to gray and feed in groups on leaves and stems. This is the moment to control them as adults are much more difficult to target. *Photo: J. Reid*

TOMATOES

Seeing more tomato fruit damage from sucking insects. Some prominent damage is coming from stink bugs on green fruit. Tiny "pin prick" holes that later turn yellow as the fruit matures. Refer to the Cornell Vegetable Guidelines for products. Read labels carefully. Some are only labelled for certain types of stink bugs such as the brown and green stink bugs. Other products are only for brown marmorated stink bugs. For organic growers, Pyganic is a broad spectrum product that shows some effectiveness. – RH

Oedema – This is a physiological (abiotic) disorder that could easily be confused for a disease. Under certain conditions plants will take up more moisture than they can transpire, and cells swell and burst with excess water. This creates scarring, often on the underside of the leaf, but can also cause leaves to roll and wilt (Fig. 4). The condition commonly plagues geraniums and winter squash, but occasionally tomatoes are affected too. Conditions that favor oedema include excess root zone moisture, cloudy weather and/or high relative humidity (in tunnels and greenhouses). Locally we have seen the application of crop oils contribute to the incidence of oedema. The oil, often applied as a natural control for mites, thrips or powdery mildew can further inhibit transpiration, leading to the bursting of leaf cells. This injury can become the site of Botrytis Gray Mold outbreaks, but generally is not of major concern. Growers experiencing oedema can consider increased ventilation, watering in the morning, and using lower labeled rates for oil-based products.

Figure 4. Leaves that roll and wilt may be a sign of oedema, caused by excess moisture and deficient transpiration. *Photo: J. Reid, CVP*

Weed Seedbank Management: A Crucial Task in August

Bryan Brown, NYS Integrated Pest Management, Cornell

Managing the weed seedbank is a critical aspect of vegetable farming, especially in August. As our vegetable crops come to maturity, so too are summer annual weeds, like pigweeds, lambsquarters, and foxtails. These plants can each produce thousands of seeds ¬– creating huge challenges for the following years.

In our research, we've observed fields with uncontrolled weeds resulting in 10 times the number of emerging weeds the following year compared to neighboring fields. It's clear that a little extra late season weed management can pay dividends by reducing future weed management costs.

Successful late-season weed management is built upon successful early-season management as well as being as effective as possible in the "layby," or final tractor pass before the crop is too large to enter. Cultivation or POST herbicides applied at this stage, combined with the shading provided by the crop, can greatly reduce late-season weeds. Furthermore, in some crop rotations, certain residual herbicides may be labeled for late-season usage.

Bryan Brown stands in front of soil samples from NY farms to test for weed seedbank density and composition. Farms vary in their weed seedbank densities based on management history. *Photo: NYS IPM*

But for the late-season "escapes" that survive these control efforts, we'll need to get creative. If you can afford it, hand pulling these weeds and removing them from the field is the gold standard for preventing seed production. But hand hoeing can also be effective, provided the weeds are not already nearing maturity, and the weather is hot and dry, causing them to desiccate before they can re-root. Spot or wick applications of herbicides can be an option but are often less effective on mature weeds. Mowing above a crop or using an electrical discharge system can be used to delay seed production until after harvest, when the field can be tilled.

In extreme situations, farmers sometimes elect to sacrifice the crop with mowing followed by tillage. This was recently the case on one NY farm with a patch of newly invading giant ragweed, which has seeds with very short longevity in the soil, allowing it to be nearly eradicated since seed production was eliminated. Other examples of weed species with seeds that are especially short-lived include pigweeds, crabgrasses, galinsogas, and horseweed (marestail).

After harvest, immediate tillage may prevent some weeds from setting seed. But if most of the weeds have already set seed, not tilling will allow those seeds to remain on the soil surface where insects, rodents, and birds can consume up to half of them. Remaining seeds still near the soil surface in the spring will be quickest to warm up and germinate, allowing for their control prior to planting. Finally, if weed seed production was much greater than usual, springtime moldboard plowing can place the remaining weed seeds too deep to germinate. It's a numbers game with weed seeds – strategic management can help you win in the long run. ●

Upcoming Events

Niagara Region Vegetable Meeting

August 14, 2024 (Wednesday) | 5:00 pm - 8:00 pm
Root Down Farm, 5850 Shimerville Rd, Clarence Center, NY 14032

Starting at Root Down Farm, hear late season disease management updates in peppers and cole crops, plus current best management practices to limit fungicide resistance. Potato variety recommendations and disease control questions in potatoes will be addressed.

Then we'll head to Kreher's beet field to view and discuss alternative weed control technologies. The beet field is an on-farm demonstration of various flame weeding protocols in comparison with stacked tool cultivation equipment. One or two weeding robots will be on-hand for live demonstrations and discussion of the technology's current abilities and future potential. Industry updates and a review of late summer disease management in squash will be provided too. See the full meeting agenda at CVP.CCE.CORNELL.EDU

2.0 DEC credits will be available in categories 23, 1a, and 10.
FREE! **Pre-registration requested: Call CCE Erie at 716-652-5400.**

Bejo Open Days 2024

August 19, 2024 (Monday) | open 9:00 am - 4:00 pm with field tours at both 10:00 am and 11:00 am
4188 Pre Emption Rd, Geneva, NY 14456

Take a ***Behind the Scenes*** look into Bejo—Bees, BMOX, and their latest innovations in Breeding! Of course, they will also have their Kitchen Garden, raised beds and field trials. Questions? Please email media@bejoseeds.com

Chipping Potato Twilight Meeting

August 20, 2024 (Tuesday) | 5:00 pm - 6:00 pm
Mahany Farms, 10046 NY-36, Dansville, NY 14437

Join us for a brief, on-farm meeting including insect pest updates and viewing of the chipping potato variety trial. 1.0 DEC credits in categories 10, 1a, and 23 will be offered. Dinner follows!

FREE! No pre-registration required. See the agenda online.

Cornell Vegetable Variety Showcase and Pathology Twilight Meeting

August 21, 2024 (Wednesday) | 5:00 pm - 8:00 pm
Homer C. Thompson Vegetable Research Farm, 133 Fall Creek Rd, Freeville, NY 13068

The event will include tours of commercial variety trials and Cornell breeding plots for tomato, pepper, squash, cucumber, and potato, as well as a vegetable disease field walk, variety tasting, and dinner. 1.75 DEC credits in categories 10, 1a, and 23 offered.

FREE and open to the public! Free dinner will be provided.
See the schedule, speakers, and register online by August 14 at https://cals.cornell.edu/cornell-vegetable-variety-showcase-and-pathology-twilight-meeting

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VegEdge is the highly regarded 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 University 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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Cornell Cooperative Extension
Cornell Vegetable Program

For more information about our program, email cce-cvp@cornell.edu or visit CVP.CCE.CORNELL.EDU