Thin, fragile seedling stems in beets and carrots make them susceptible to heat, wind and diseases. What disorders should you watch for?

PAGE 1

Hairy galinsoga is the Weed of the Week. Learn more about this pest and how to control it.

PAGE 3

Cabbage maggot larvae feed on and tunnel into the roots of Cole crops, resulting in death or severe stunting. Preventative control is key!

PAGE 8

Angular leaf spot attacks cucumbers and zucchini squash but other vine crops can be affected as well. Learn how to manage this disease.

PAGE 9

VEGEdge

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Volume 10 | Issue 8 | June 4, 2014

Cornell University
Cooperative Extension
Cornell Vegetable Program

Fresh market peas.
Photo: Judson Reid, CVP

Death of a Seedling: Beets and Carrots

Julie Kikkert, CCE Cornell Vegetable Program

Call me a pessimist, but the recent and continued planting of many crops coupled with often hot and windy days in June, has me concerned about beet and carrot seeds/seedlings. A number of years ago, I was called to diagnose a field of beets in which the seeds were just not coming up. While dry conditions and hot temperatures can delay germination, seeds dug up from the field and observed with a microscope were determined to have been killed from hot soil temperatures while they were in the process of germinating.

Beet and carrot seedlings have thin, fragile stems which make them susceptible to heat, wind and diseases while they are young (Fig. 1). The most common disorders are listed below:

Heat Canker

High soil temperatures and direct sunlight can cause tissues to die at or near the soil surface as the stems heat up. Very small seedlings will collapse all together. Older plants may survive when only the outer layers of the stem are killed. However, the flow of nutrients from the foliage to the roots is inhibited causing a swelling above

Figure 1. Young carrot seedlings (center) are susceptible to heat and wind damage. The larger barley nurse crop provides protection.
Photo: Julie Kikkert, Cornell Vegetable Program

continued on page 3

VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serving 11 counties in Western New York.

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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Contents

The next issue of VegEdge will be produced June 11, 2014.

WNY Sweet Corn Trap Network Report

Marion Zeufle, NYS IPM Program, 6/3/14

European corn borer flight has started in 4 of the 7 sites reporting this week. The highest count was 20 ECB-Z at the new site in Seneca Castle. Corn earworm (CEW) and fall armyworm (FAW) were not caught at any of the reporting sites. Western bean cutworm (WBC) traps will be set in the next 1-2 weeks.

ECB moths are attracted to the most advanced corn, especially fields started under plastic or row cover. In these early plantings, larvae don't feed in the whorl and emerge in the tassel as they do in bare ground corn and the usual scouting and threshold recommendations do not apply. For management recommendations for ECB in early corn please see "Managing ECB in plastic, row cover, or transplanted sweet corn" at http://sweetcorn.nysipm.cornell.edu/.

WNY Pheromone Trap Catches: June, 03, 2014

Location	ECB -E	ECB -Z	CEW	FAW	WBC
Baldwinsville (Onondaga)	NA	NA	NA	NA	NA
Batavia (Genesee)	NA	NA	NA	NA	NA
Bellona (Yates)	NA	NA	NA	NA	NA
Eden (Erie)	0	1	0	0	NA
Farmington (Ontario)	7	2	0	0	NA
Hamlin (Monroe)	NA	NA	NA	NA	NA
LeRoy (Genesee)	NA	NA	NA	NA	NA
Lockport (Niagara)	0	0	0	0	NA
Penn Yan (Yates)	2	0	0	0	NA
Seneca Castle (Ontario)	3	20	0	0	NA
Spencerport (Monroe)	NA	NA	NA	NA	NA
Waterport (Orleans)	0	0	0	0	NA
Williamson (Wayne)	0	0	0	0	NA

continued from cover - Death of a Seedling: Beets and Carrots

the canker (Fig. 2). The plants then wilt and break off at the crown. Muck soils are most conducive to this injury. Damage may be more prevalent on the south or south-west side of stems.

Figure 2. Similar to beets and carrots, heat canker, shown here in *Eucalyptus*, causes a constriction of the stem at the soil line.
Photo: Edward L. Barnard, Florida Dept of Agriculture, Bugwood.org

Wind Whipping
Whipping of plants in strong wind and/or blowing particles of soil can injure the stems of seedlings at the soil line. The damage is often similar to that seen with heat canker.

Seed Decay and Damping-off Disease Symptoms
Pythium spp. and *Rhizoctonia* spp. can infect seeds and seedlings of beets and carrots. *Aphanomyces cochlioides* and *Phoma betae* can also infect beets. Infected seeds may decay or seedlings may fail to emerge from the soil. Healthy seedlings that become infected after emergence may exhibit a water-soaked and necrotic area at or just below the soil line. The plants then wilt, and die causing the typical damping off symptoms (Fig. 3).

Figure 3. Damping-off in beet seedlings, characteristic of both *Rhizoctonia solani* and *Pythium* spp. Note progression of disease up the stem.
Photo: Robert M. Harveson, University of Nebraska.

Wire-Stem Symptoms in Beets *(from Abawi, et al. Root Rot of Table Beets in New York State, 1986)*
The stem and main root regions of 2- to 4-week-old infected seedlings that survive the post-emergence damping-off stage usually become partially or completely shriveled; giving them a thread-like appearance. The infected regions are brown to black. Seedlings with wire-stem symptoms may have normal branching fibrous root systems, or roots that are brown and at different stages of rotting. Severely infected plants are stunted and reddish-purple. If plants are stressed and the infection progresses, infected roots may rot off just below the soil surface, and result in plant death and a reduced stand. Factsheet with photos available at http://vegetablemdonline.ppath.cornell.edu/

Weed of the Week

HAIRY GALINSOGA

Darcy Telenko, CCE Cornell Vegetable Program

Hairy galinsoga (*Galinsoga ciliata*) is a summer annual that emerges April to June. It is native to Eurasia and reproduces by seed with 5,000-10,000 seed per plant. These seeds can remain viable for many years in the soil. It has become a common problem in a number of our vegetable production areas (see NY distribution map). Galinsoga has opposite, egg-shaped to triangular leaves with toothed margins. All leaves and stems are hairy. It will flower from June to late fall with distinct flowers that have yellow disc flowers (center flowers) with four to five white three-toothed ray flowers (outer flowers). This summer annual is more common in tilled soil and generally germinates in the top ½ inch of soil. Galinsoga will begin flowering and producing seed once it has five to six leaves and will continue to produce seed until it is killed by frost. The seed has little to no dormancy and begins to sprout allowing three to five generations to occur during one growing season.

Cultivation has limited effectiveness in controlling Galinsoga as roots can quickly reestablish from cut stems and uprooted plants unless dry conditions are present following cultivation. Moldboard plowing to bury the seed and rotations with winter grains and hay crops may improve competition and reduce seed production. Many herbicides available for vegetable production have limited effectiveness on Galinsoga. Herbicides that have been found to be effective on Galinsoga include AAtrex, Dual, Lasso, Lorox, metribuzin, and Stinger.

Distribution of Hairy Galinsoga in New York

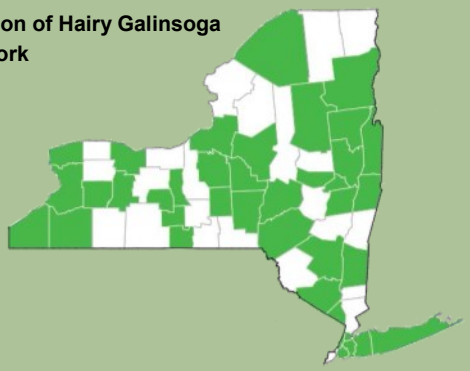

Image courtesy: EDDMapS. 2014. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org/; last accessed June 3, 2014.

Managing Perennial Sowthistle with Stinger, 2013 Research Summary

Christy Hoepting, CCE Cornell Vegetable Program

Perennial sowthistle thrives in the muck lands where onions are grown, because it is favored by fine rich soils with high water holding capacity and high light intensity. This perennial weed reproduces by seed, but most importantly by specialized horizontal underground stems, called rhizomes, from which numerous new shoots are produced. Once it becomes established in onion production, it is very difficult to manage. Preliminary Cornell research studies have shown that the most effective strategy for controlling perennial sowthistle is to let it re-grow in the fall after onion harvest and then to burn it down chemically in the fall. Realistically, only a tiny portion of onion acreage is harvested early enough to allow for sufficient re-growth for this strategy to be effective. None of the regular herbicides labeled in onions control perennial sowthistle and hand-weeding stimulates bud-break resulting in even more weeds and a much worse problem at the end of the season. In 2013, we studied the use of Stinger herbicide, a growth regulator for its ability to manage this ferocious weed problem. Following is a summary of what we learned.

Figure 1. The mid-rosette stage (a) of perennial sowthistle is the most susceptible to Stinger, while emergence (b), late-rosette stage (> 7" no stalk) and bolt stages (b) when the seed stalk begins to grow up are the hardest to kill with Stinger.
Photos: C. Hoepting, CVP

Stinger is not labeled on onions! This is a report of research results. These are not recommendations. For detailed reports, visit the CVP website, from the top menu, click on "onions", then scroll down and click on "view complete list of content" and there will be 4 reports on managing perennial sowthistle: http://cvp.cce.cornell.edu/crop.php?id=20&list=yes

Mid-rosette stage most susceptible to Stinger: Unlike with other post-emergent herbicides like Goal or Chateau where the most susceptible weed stage is the smallest sized weeds, for Stinger it is the mid-rosette stage with 5-9 expanded leaves and 4-7 inches in diameter, while newly emerged, late-rosette and bolt stages are the most difficult to control (Fig. 1).

Excellent kill achieved with 16 fl oz of Stinger, the higher the rate the better: By applying a maximum of 16 fl oz of Stinger in different spray programs, we generally achieved 90% weed control (Table 1). A single application of Stinger 4 fl oz was able to kill weeds in the mid-rosette stage most of the time (Fig. 2). Comparatively, a single rate of 8 fl oz of Stinger could kill perennial sowthistle in late-rosette and early-bolt stages. The 16 fl oz rate of Stinger killed perennial sowthistle in the mid-bolt stage, both above and below-ground parts (Fig. 3 & Table 1).

Figure 2. A single application of Stinger 4 fl oz usually could kill perennial sowthistle at the mid-rosette stage (dead weed). Once weeds were in late rosette stage or had started to bolt, this rate of Stinger failed to achieve kill (green weeds in background).
Photo: Christy Hoepting, Cornell Vegetable Program

High-Low is the way to go! Best treatments were when the first spray was 8 fl oz compared to 4 fl oz, because the higher rate was able to kill some weeds in the late-rosette and early-bolt stages that the 4 fl oz rate could not. Therefore, when 4 fl oz was followed by 8 fl oz (Low-Hi), the escapes from the first application were too big to achieve kill. Alternatively, 8 fl oz achieved better kill upfront which made it easy for the follow-up 4 fl oz rate to finish the job (Hi-Low) (Fig. 4 & Table 1).

3-4 sprays spread out were better than 1-2 up front: Even though excellent kill was achieved initially with 16 fl oz of Stinger and 2 applications of 8 fl oz 2 weeks apart, eventually

some of the injured weeds outgrew their injury and new emergence occurred in these treatments. Comparatively, the 3rd and/or 4th apps of 4 fl oz in the Max 16: Hi-Low+4, Low-Hi+4, and 4 x 4 treatments had slightly better weed control at the end of the season than the Max 16 treatments with only 1 and 2 applications, because these later low rate applications were enough to keep any re-growth in check (Table 1).

Best tolerance of onion to Stinger at 4 to 6-leaf stages: Onions cannot tolerate applications of Stinger when applied once they have started to bulb, especially when > 8 fl oz is applied. Also, high risk of injury occurred when 8 fl oz or higher was applied to the 2-leaf stage. Single applications of Stinger at 4, 8 and 16 fl oz to onions at the 4, 5 and 6-leaf stages resulted in less than 5% crop loss due to unmarketable injured bulbs. Onions were tolerant to the most effective treatment for controlling perennial sow thistle (Max 16: Hi-Low+4) only when it was applied starting at the 4-leaf stage; when it started at the 2-leaf stage, it resulted in 5% bulb injury.

Next steps: So now we have an understanding what it takes to kill perennial sowthistle and what the onions can tolerate with Stinger. We know the most susceptible weed stage, that we'd like to use at least 8 fl oz of Stinger, and that we cannot apply Stinger after bulbing. Now, we are strategizing the best way to utilize 8 fl oz of Stinger when the onions are the most tolerant within an integrated approach including the use of Chateau and Nortron herbicides and hand-weeding to provide season-long control.

Special Thanks: This project was funded in-part by the Onion Research and Development Program. Special thanks to CVP Program Assistant, Elizabeth Buck for her expertise contributions in weed science and plant physiology, and her dedication to this project.

Table 1. Evaluation of Stinger for management of Perennial sowthistle, field trial, Elba, NY 2013.

Treatment		% Control (compared to untreated)		
Rate (per acre)	Leaf Stage*	Based on Ground Cover (Jul-30)	Based on Weed Biomass (fresh weight) (Aug-13)	Total (% ground + % biomass)
Hand weeded	4-leaf	64.9	58.2	123.1
Stinger 4 fl oz	4-leaf	42.9	72.9	115.8
Stinger 4 fl oz	6-leaf			
Max 16: Hi-Low+4				
Stinger 8 fl oz (Hi)	2.5 leaf	92.2	99.4	191.6 – 1st
Stinger 4 fl oz (Lo)	4 leaf			
Stinger 4 fl oz	6-leaf			
Max 16: Low-Hi+4				
Stinger 4 fl oz (Lo)	2.5 leaf	90.9	92.3	183.2
Stinger 8 fl oz (Hi)	4 leaf			
Stinger 4 fl oz	6-leaf			
Max 16: 4 x 4				
Stinger 4 fl oz	2.5 leaf	87	95.3	182.3
Stinger 4 fl oz	4 leaf			
Stinger 4 fl oz	6-leaf			
Stinger 4 fl oz	7-8 leaf			
Max 16: 8 x 2				
Stinger 8 fl oz	2.5 leaf	92.2	83.5	175.7
Stinger 8 fl oz	4 leaf			
Max 16: 16 x 1				
Stinger 16 fl oz	4-leaf	85.7	95.9	181.6

weed stages and date of application per leaf stage:
2.5-leaf: weeds new emergence to late-rosette, Jun-7.
4-leaf: weeds new emergence to mid-bolt, Jun-20.
6-leaf: weeds new emergence to early-bolt, Jun-27.
7-8 leaf: weeds early- to mid-bolt, Jul-5.

Figure 3. A single application of Stinger 16 fl oz killed perennial sowthistle in the mid-bolt stage (stalk ~6" tall); both above and below-ground parts.
Photo: Christy Hoepting, Cornell Vegetable Program

Figure 4. High-Low is the way to go! By starting with 8 fl oz of Stinger, enough injury is caused to larger weeds that 4 fl oz of Stinger applied 2 weeks later was able to finish the job. When this program was followed by another 4 fl oz 2 weeks later, this became the best treatment in the trial.
Photo taken before the last 4 fl oz spray, on Jun-27 by Christy Hoepting, Cornell Vegetable Program

CROP INSIGHTS

COLE CROPS

As expected, flea beetles continue to be a pest in new plantings. Worm pressure increased over the past week with the warmer weather including Imported cabbage worm and diamondback moth (DBM), especially on imported bareroot transplants. The early season spray threshold for worm pests in 5% infestation. Generally, early season worms are easy to control with pyrethroids or Bts. Bts do not control flea beetles, however. With high winds and temperatures in the 80s, there have been some reports of wind-whipping (Fig. 1). To distinguish from wirestem, wind-whipped plants do not have a dark discoloration at the soil line. Hardening off is important to avoid wind-whipping; unfortunately, there is nothing that can be done for direct seeded seedlings. Emergence of the overwintering population of cabbage maggot as adult flies is complete across our region, according to degree day models available on NEWA. This event coincides with the flowering of Yellow Rocket. Thus, increased feeding activity is also expected to occur within the next couple of weeks – see article for preventative control options, page 8.

Figure 1. Wind-whipping of direct seeded cabbage seedling. *Photo: Chris Daum, Helena Chemical Co.*

DRY BEANS

We will be looking for growers to host Western bean cutworm (WBC) survey traps in their dry beans fields once again. It's important that there be a corn field adjacent to the bean field, for best results. If you're interested contact Carol MacNeil at crm6@cornell.edu or 585-313-8796.

Be sure to note weed problems from previous years in fields where you will be planting dry beans. Most weed seed survives for many years. Have you had lambsquarters, ragweed, hairy or Eastern black nightshade, velvetleaf or nutsedge slipping through your herbicide program? The chart of Herbicides for Snap and Dry Bean Weed Control, with all common weeds and all recommended herbicides with ratings for effectiveness, will help you choose the best herbicides for your fields. See it on the dry bean webpage at: http://cvp.cce.cornell.edu. Click on the link to the chart or contact Carol for a copy.

GREENS

Flea beetle damage has lessened in many areas this week while others are still battling the damage. Several thorough treatments will be needed in persistent high insect populated areas. Using a wide fan spray nozzle to cover the areas of ground on either side of the plants can help hit the insects as they hide away from the crops.

With hay fields being mowed and baled, leaf hoppers should be scouted for. Watch for small yellowish green fleeting insects diving off plants as you walk between the rows. Lettuce is susceptible to the feeding of the hoppers. Damaged leaves are unsightly and at worst, virus can be passed causing distorted leaf growth.

Slugs maybe problematic where higher plant residues are found and damper conditions persist. In several locations this week, many tiny slugs were found on the undersides of lettuce and between the lower leaves and stems of mustard and collard plantings.

ONIONS

There is variability in the onion crop across the region with thinned stands due to water-saturated soils in Wayne Co. and Potter mucks due to mid-May's heavy rains, while in the Elba muck lands, stands are some of the best in a while. Direct seeded onions are generally coming out of the flag leaf stage with many fields around the 2-leaf stage. Earliest transplanted onions are already at the 7-9 leaf stage and transplanting is just finishing up. Most of the region saw about a half inch of gentle rain on Tuesday morning, just as things were getting a bit dry, at least in Elba. With exception of only a few known hot spots in Wayne Co., Botrytis Leaf blight remains barely existent with only the odd lesion being detected. Onion thrips are also not an issue at this time. According to the degree day models on NEWA, peak flight of the overwintering population of onion maggot has occurred within the past week, so we can expect to see feeding injury within the next couple of weeks. Pull up any seedlings that are wilted and look for white maggots feeding inside the base of the bulb. If you notice any above-average levels of damage, please let Brian Nault or Christy know. As the barley nurse crops are dying down, flushes of green weed escapes are becoming more apparent, which is the main concern for management right now. In Elba, perennial sowthistle is coming in fast and furious in some fields (Fig. 1) – see article, page 4. The 2-leaf stage is the minimum stage for applications of post-emergent herbicides Buctril and Chateau; it is 3-leaf for Goal – see last week's issue for article.

Figure 1. The new enemy of muck-grown onions, perennial sowthistle.
Photo: Christy Hoepting, Cornell Vegetable Program

The 2-leaf stage is also when foliar applications of manganese (Mn) should first be applied. Manganese is an important micronutrient in onions for synthesis of carbohydrates and proteins, and according to Cornell records, is generally abundant in muck soils. The exception is where the muck is shallow and above newly installed drainage tile lines where the underlying calcareous marl was brought to the surface (Fig. 2). Manganese is less available in muck soils when the pH is greater than 6.0, especially in dry soil. In Orleans and Genesee counties, calcareous marl with a high pH underlies some of the muck. In one case study in Elba, the pH of the marl brought up when installing drainage tiles was 8.5. Two years later, after blending and fall applications of sulfur, the pH was 6.7, compared to 5.4 between the tile lines. By early-July, the onions above the tile lines were noticeably stunted and yellow (Fig. 2). Leaf-tissue analysis showed a 50% reduction in Mn

Figure 2. Marl brought up from installing drainage tile lines (left) with high pH can result in a nutrient imbalance including manganese deficiency and stunted onions (right, taken 7/1/2013). *Photos: Christy Hoepting, Cornell Vegetable Program*

and 33% reduction in phosphorous in the onions grown in the high pH soil compared to those with normal pH. In a 2010 Cornell study, onions responded to foliar applications of 2 lb/A of Mn as manganese sulfate + manganese chloride 33% at the 2-3 leaf and 5-6 leaf stages with an insignificant 30% increase in total yield only when soil Mn was less than 9 lb/A using Morgan extraction. In the same study, onions did not respond to Mn + P banded below the seed. Studies in Michigan on onions grown in muck showed a 20% increase in total yield and a 17% increase in > 2.5 inch bulbs with the application of 2 lbs/acre manganese sulfate at the 3 leaf stage (Jun-25) and 3 weeks later (Jul-14). Treatment after Mn-deficiency symptoms appear is often too late. Rather, onions may benefit by applying preventative foliar treatments of Mn starting at the 2-3-leaf stage. Darryl Warnke, muck soil scientist emeritus at MSU recommends Mn-sulfate as opposed to chelated forms of Mn.

Muck Donut Hour with Christy has started for the season in Elba on Tuesday mornings from 8:30 am to 9:30 am on the corner of Transit and Spoilbank – all are welcome!

POTATOES

Potato planting has been moving "full speed ahead" after the late spring and heavy rains of mid-May. Potatoes are at all stages, from just planted to green row to 6+ inch tall plants. One very early local market grower will be harvesting a few small potatoes soon! (See the *Late Blight Risk* section for determining "first emergence" for counting severity values (SV) for timing the first fungicide spray.) Colorado potato beetles (CPB) are out in full force on larger potato volunteers, and egg-laying has started. If you used a systemic insecticide seed or in-furrow treatment at planting note that all available materials are closely related (containing either imidacloprid or thiamethoxam), and resistance to them has been seen locally. If you didn't use a seedpiece or in-furrow treatment, and your 2014 potatoes are close to where potatoes, tomatoes or eggplant were last year, scout potatoes for CPB adults or feeding. If the population approaches 1 CPB adult/plant the field needs an insecticide treatment. Chloronicotinyl insecticides (active ingredients imidacloprid, thiamethoxam or acetamiprid) are effective against CPB adults, if resistance isn't present. Coragen or Voliam Xpress are other, non-chloronicotinyl, choices for adults. To avoid the development of resistance don't use the same chemical class of insecticide on more than one CPB generation in a year.
For organic growers, there are no materials which will control adult CPB. There are a number of choices of biological and botanical materials, but all must be applied at egg-hatch or while larvae are small, for good control. See Insect Management at: http://nysipm.cornell.edu/organic_guide/potato.pdf Always check with your organic certifier before spraying.

PROCESSING CROPS

A nice stretch of weather this past week had farms planting as fast as they could to make up from lost time in May. Snap bean planting started nearly on time and should remain on schedule if the weather holds. Planting of other crops is well underway. See general article on beet and carrots seedlings and potential problems you may see as you are out scouting. Vigorous seed, effective seed treatments and good crop rotations will reduce the risk of seedling diseases. Rain on Monday night and Tuesday provided moisture for germination and activation of pre-emergence herbicides (although more may be needed in some areas). The rain is also going to enhance weed seed germination and growth – so scouting and treatment is a high priority over the next several weeks.

SWEET CORN

Corn flea beetles were seen feeding on several plantings across WNY this week. Damage was lite but if the sweet corn varieties aren't Stewart's Wilt resistant then problems could occur later. Flea beetles can transmit this bacterial disease.

Stewart's Wilt causes stunting, wilting, and can kill off large sections of leaf tissue. Severe cases, the plants die. Symptoms can occur at any stage of the plant's development. The disease is easily recognized by yellow to brown stripes running down the leaves. The stripes can have wavy or irregular margins.

VINE CROPS

Seed corn maggots were busy in a couple of early plantings of summer squash and melons. The maggots feed on roots and some have burrowed their way up into the stems, killing the transplants. Adult flies are about 1/4 inch long and gray black in color and maggots are yellowish white.

Seed corn maggots can be found in areas of higher plant residue or high organic matter, such as planting into a previous field of corn, for example. Treated seeds can help ward off maggots (contact your seed dealer concerning new treated seed technology) while delaying plantings till later into June can avoid the life cycle.

Seed corn maggot damage. *Photo from UMN veg newsletter*

Preventative Control Options for Cabbage Maggot in Cole Crops

Christy Hoepting, CCE Cornell Vegetable Program

Emerged cabbage maggot (CM) flies mate and lay eggs, which hatch in 2 - 10 days, depending on temperature. CM larvae feed on and tunnel their way into the roots of young plants, resulting in death, severe stunting or unmarketable feeding damage in radish. Above-ground symptoms include wilting and stunting (Fig. 1a). When the plant is uprooted, white maggots up to 0.25 inch in length with black mouthparts should be evident (Fig. 1b). Look for brown tunnels in stems and roots. Broccoli and cauliflower are more susceptible than cabbage and Brussels sprouts. CM can be sporadic and are favored by cool temperatures and moist soil conditions. Protection from CM is often needed in earliest plantings in the field and transplant beds. Unfortunately, once plants are established, there is nothing that can be done to control CM.

Figure 1. Cabbage maggot in broccoli: **a)** above-ground symptoms of stunting and wilting, and **b)** below ground - maggots and pupa in proximity of infested seedling. *Photos: Christy Hoepting, Cornell Vegetable Program*

Lorsban (15G, 4E, 75WG and Advanced) and its generics (e.g. Warhawk), an OP insecticide, can be used at transplanting as an in-furrow application or immediately after seeding or transplanting as a directed banded spray (rates based on 4-inch band) on most Cole crops. A minimum of 40 gpa should be used when Lorsban is applied as a band over the row. Do not add any adjuvants, surfactants or spreader stickers. ***Check the pH of your tank-mix with Lorsban, it should not be greater than 7, or else it will not work properly.*** Note, transplant water treatments of Lorsban may result in stand reduction due to plant stress at time of transplanting. Lorsban is also labeled as a band treatment for direct seeding where the band placement should be behind the planter shoe and in front of the press wheel to achieve shallow incorporation. Make sure that the proper rate of Lorsban and depth of incorporation is used, or else the product will be diluted and off-target, leading to control failures.

Diazinon (AG500, 50W and AG600 WBC), another OP insecticide, can be used in the same manner as described for Lorsban except for the band treatment with direct seeding. In addition, diazinon can also be used on seedbeds, broadcast and incorporated just before planting. It is only labeled on broccoli, Brussels sprouts, cauliflower, cabbage and rutabagas.

Lorsban and Diazinon are federally-restricted organophosphate materials and require oral warnings and signs to be posted at the entrances of treated areas.

Coragen (new in 2012), a diamide insecticide, has a 2 (ee) label to be used as a transplant water treatment for control of CM in cabbage only. Apply 5 fl oz per acre as a transplant water treatment at planting. Apply a minimum of 2 fl oz of treatment solution per plant. It is critical that transplants be watered before transplanting and that the root zone is adequately treated or poor performance will result. Coragen is systemic and needs to be taken up by the roots and get into the plant to be effective. It does not move well in soil. Therefore, it does not work well as a directed spray to the base of plants after planting and is not labeled for CM in this manner. Do not apply more than 10 fl oz of Coragen per acre per crop by any combination of soil and foliar applications. In a preliminary Cornell study, Coragen performed statistically as good as Lorsban 4E for CM control. The 2(ee) label must be in the possession of the user and is available at http://128.253.223.36/ppds/529807.pdf.

Advantages of using Coragen over Lorsban include:

1) Coragen also provides excellent control of worms and flea beetles;
2) There are no risks of phytotoxicity to the crop with Coragen;
3) Coragen belongs to a different chemical class than Lorsban and Diazinon for resistance management;
4) Coragen is not a restricted use insecticide.

Capture LFR, a pyrethroid insecticide, is labeled for CM control as a band over the row on the soil surface, or over the furrow (T-band), or in-furrow with the seed. In Cornell studies, Lorsban performed much better (compare 100% clean plants with Lorsban to 55% with Capure LFR) than Capture LFR for control of CM.

Late Blight Risk

Carol MacNeil, CCE Cornell Vegetable Program

Late blight (LB) severity values (SV) have been accumulating rapidly at some stations and have reached, or nearly reached, the 18 SV threshold, an alert for the need for the first fungicide spray! Growers in those areas have a week to get a spray on potatoes 4+ inches tall, and unprotected field tomatoes. Generally the first emergence of potatoes in our region occurred around May 15 so we are using this date for the SV chart. There was at least one isolated small local market planting in our region that emerged much earlier, however. Growers should begin counting SVs from the earliest emerging potato foliage (planted, cull or compost pile), or the earliest unprotected field planting of tomatoes (southern plants only), within 30 miles, even though your crop may not have emerged. Those early plants could be infected with LB, and the spores produced could potentially reach your crop when it does emerge. You can select a different first emergence date at: http://newa.cornell.edu/index.php?page=potato-late-blight Select the closest weather station, a first emergence date, and click on Get Report. Check your potato cull piles to be sure they're covered with at least two feet of soil. Culls need to be buried deeply, fed to livestock, etc. ASAP so they don't serve as a source of LB for your potato or tomato crop. So far this season LB has been detected in potatoes and tomatoes in several counties in FL, all US-23, but not farther north. To check on LB confirmations, or to sign up for Alerts to LB detected close by, go to: http://www.usablight.org/

Late Blight Severity Values* 6/03/14

Location**	Week	Total	Location	Week	Total
Albion	1	8	Lodi	4	10
Appleton	0	1	Medina	1	6
Baldwinsville	0	4	Penn Yan***	7	18
Buffalo***	3	15	Ransomville	1	3
Bergen	0	0	Romulus	5	20
Ceres	1	4	Rochester***	5	13
Elba	2	8	Silver Creek	4	17
Farmington	0	4	Sodus	2	4
Gainesville	7	17	Versailles	1	2
Geneva	0	2	Williamson	0	2
Kendall	1	8	Wolcott	NA	NA

* Severity value accumulations start 5/15/2014
**For more sites: http://newa.cornell.edu/ Crop Pages, Potato, Blitecast
***Airport stations, with RH increased to estimate field conditions

Angular Leaf Spot and Early Squash

Chuck Bornt, CCE Eastern NY Commercial Horticulture Program, Weekly Vegetable Update, Vol. 2, Iss. 7, 5/29/2014

Although it has been relatively dry, we have had some daily light rain showers that have kept leaves wet for a longer than normal period which means more opportunity for some diseases to get started. The one that comes to mind first is Angular leaf spot. Angular leaf spot (ALS) is caused by a bacterium Pseudomonas syringae, which **attacks cucumber and zucchini squash primarily but also is a problem for melons, some winter squash, pumpkins and gourds**. Summer squash right next to the zucchini appeared unaffected so far. This is something of a regular occurrence the last couple years with ALS showing up very early in zucchini plantings.

The photo below is of zucchini squash grown under row cover. Initially leaf symptoms appear as small, irregularly shaped, water-soaked lesions. The spots expand until they are limited by larger veins, giving them the angular appearance which the disease is named for. Under our current humid conditions, the water-soaked spots can be covered by bacterial ooze, which can dry and give the leaf area near the spot a crusty appearance. This can also happen on the underside of the leaf. As the spots dry, they shrink and tear away from the healthy tissue leaving large, irregular holes and giving the leaf a ragged appearance. Squash and watermelon leaf lesions are more variable in size than cucumber lesions which are usually smaller. The squash and melon lesions can be surrounded by a yellow halo. Lesions can appear on the fruit as well, but will be more circular and are smaller than on the leaf. If left untreated, the ALS lesions will crack open, allowing secondary fungi and bacteria to invade possibly resulting in a slimy, foul-smelling fruit rot.

Images of zucchini with Angular Leaf Spot: From left to right, you can see early symptoms on lower, older leaves, then more advanced symptoms, and finally complete leaf death.
Photos: Chuck Bornt, ENY Commercial Horticulture Program

The Pseudomonas bacterium is a seedborne pathogen, but it can also overwinter in infested crop residues. The disease is widespread and is especially damaging when there are extended and frequent summer rains when daily temperatures range between 75 and 82°F. Two weeks of dry weather will really help in arresting the disease.

To manage angular leaf spot, strive to plant certified, pathogen-free seed. There are resistant cucumber varieties, but no squash or melons are resistant. A cucurbit rotation should

continued on next page

continued from page 9 - Angular Leaf Spot and Early Squash

avoid replanting in the same field for at least 2 years as the bacteria can survive for that same duration. Do not over fertilize and avoid overhead irrigation as well as handling plants while they are wet. This includes cultivation, harvesting etc. Harvest clean plantings first and any infected plantings last as this will help slow the pathogen down. Also, the hot, dry weather predicted to start this weekend will also help dry the pathogen up. Plow under or burn crop debris immediately after harvest. Apply a recommended bactericide at first sign of disease. Tank-mix copper with fungicide like mancozeb that can protect from secondary infection. Copper fungicides will help slow disease spread during particularly wet periods but can be dropped if dry weather continues for 2 weeks.

Angular leaf spot.
Photo: Tom Zitter, Cornell

Angular leaf spot close-up showing dried lesions and active infections coming in between veins.
Photo: Tom Zitter, Cornell

UPCOMING EVENTS

Muck Donut Hour

June 10, 2014 | 8:30 - 9:30 AM
Elba muck, corner of Transit and Spoilbank, Elba 14058

Meet with Cornell Vegetable Program Specialist Christy Hoepting every Tuesday morning to ask questions and share your observations.

Weed Control - June Walk & Talk Discussion Group

June 11, 2014 | 6:30 PM
On the River Farm, 7579 St Rt 19, Belfast 14711

1.5 DEC credits are available in categories 1a, 10, 21, and 23. A crop walk focused on how cultural practices can help reduce weed pressure, and discussion on enhancing in-season control of difficult weeds. FREE! For more details, contact Elizabeth Buck at 607-425-3494 or emb273@cornell.edu.

Farm Food Safety Training / GAPs Overview

June 16, 2014 | 8:30 AM Registration & Refreshments; 9:00 AM - 3:30 PM Training
Arkport American Legion, 1 Carter St, Arkport 14807

An overview of farm food safety practices, this **1 day only** training is meant to be an introduction and is not the full GAPs training. This will be a unique **training without the use of technology**. This will be an outline format with discussion and no power point presentation. $50 per person; $10 each additional attendee from the same farm. Contact Robert Hadad at 585-739-4065 for more info. To register, call 585-268-7644 x18 or email Lynn Bliven at lao3@cornell.edu. Pre-register by Friday, June 13, 2014. Space is limited!

Muck Donut Hour

June 17, 2014 | 8:30 - 9:30 AM
Elba muck, corner of Transit and Spoilbank, Elba 14058

Meet with Cornell Vegetable Program Specialist Christy Hoepting every Tuesday morning to ask questions and share your observations.

Beneficial Insects and Habitats - June Rolling Hills Discussion Group

June 17, 2014 | 6:00 - 7:30 PM
Honeyhill Farm, 6241 Price Rd, Livonia 14487

1.5 DEC credits are available in categories 1a, 10 and 23. Abby Seaman and Marion Zuefle, of the NYS IPM Program, will teach which beneficial insects are used to control certain pests. Come learn about their lifecycles, predation strategies, and potential to be used on your farm! Kira White, Vegetable Manager at Honeyhill Farm, will share the farm's use of benefical insect promoting habitat. FREE! A potluck dinner will follow the meeting. For more details, contact Elizabeth Buck at 607-425-3494 or emb273@cornell.edu or Robert Hadad at 585-739-4065 or rgh26@cornell.edu.

Weather Charts

John Gibbons, CCE Cornell Vegetable Program

Weekly Weather Summary: 5/27 - 6/02

Location	Rainfall (inch)		Temp (°F)	
	Week	Month June	Max	Min
Albion	0.00	0.00	83	43
Appleton, North	0.06	0.00	83	40
Baldwinsville	0.15	0.15	90	45
Buffalo*	0.20	0.00	82	50
Ceres	0.46	0.00	82	39
Elba	0.23	0.00	81	42
Farmington	0.69	0.69	87	43
Gainesville	0.03	0.03	81	39
Geneva	0.27	0.27	85	44
Kendall	NA	NA	NA	NA
Lodi	0.22	0.01	88	45
Penn Yan*	0.25	0.00	87	48
Ransomville	0.00	0.00	81	46
Rochester*	0.00	0.00	87	48
Romulus	0.00	0.00	88	47
Silver Creek	0.32	0.20	80	49
Sodus	0.25	0.23	88	41
Versailles	0.01	0.01	80	47
Williamson	0.44	0.44	85	42
Wolcott	NA	NA	NA	NA

Accumulated Growing Degree Days (AGDD)
Base 50°F: April 1 — June 2, 2014

Location	2014	2013	2012
Albion	335	439	418
Appleton, North	246	342	364
Baldwinsville	410	444	487
Buffalo	341	496	497
Ceres	318	356	400
Elba	265	402	477
Farmington	377	417	433
Gainesville	279	452	420
Geneva	386	459	473
Kendall	NA	457	NA
Lodi	406	509	506
Penn Yan	404	462	486
Ransomville	302	395	412
Rochester	407	505	496
Romulus	387	458	NA
Silver Creek	313	456	443
Sodus	357	396	412
Versailles	341	488	460
Williamson	301	423	432
Wolcott	NA	415	NA

* Airport stations
** Data from other station/airport sites is at: http://newa.cornell.edu/ Weather Data, Daily Summary and Degree Days.

Cornell University
Cooperative Extension
Cornell Vegetable Program

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VEGEdge

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VegEdge is the award-winning newsletter produced by the Cornell Vegetable Program in Western New York. 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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