Powdery Mildew is affecting tomatoes! Growers in our area are reporting success in controlling PM with several products.

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The EPA is proposing to prohibit the application of pesticides that are highly toxic to bees when bees are under contract pollination services.

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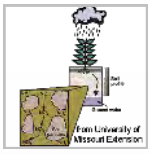
In-season management of perennial sowthistle in direct seeded onions is all about timing, growth stage, rate and out-smarting this weed!

PAGE 6



Have the heavy rains caused a loss of nitrogen in your soil? Learn more about nitrate leaching and denitrification.

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VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Volume 11 | Issue 9 | June 10, 2015

Photo: Judson Reid

Cornell University
Cooperative Extension
Cornell Vegetable Program

Powdery Mildew – Get It Before It Gets You!

Judson Reid, CCE Cornell Vegetable Program

We are sounding an alarm bell on Powdery Mildew in Central and Western New York. But we aren't talking pumpkins – this is a disease of tomatoes! This pathogen is a fungus of the Oidium genus, with species soon TBD by Cornell plant pathologists. Research has found that tobacco, eggplant and potato may host the pathogen, among many other families of ornamentals; although there is scientific debate on the exact species and host range.

First detected in April of 2015 (in NYS), new cases are coming in every week. Given that the pathogen requires a living host how did this begin so early? Likely in overwintered plants and greenhouses that were

Figure 1. Severe Powdery Mildew infection of high tunnel tomatoes. *Photo: Judson Reid, CVP*

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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.

We're interested in your comments. Contact us at:
CCE Cornell Vegetable Program
480 North Main Street, Canandaigua, NY 14224
Email: cce-cvp@cornell.edu

Web address: cvp.cce.cornell.edu

Editor
Carol MacNeil

Contributing Writers
Robert Hadad
Christy Hoepting
Julie Kikkert
Carol MacNeil
Judson Reid
Darcy E. P. Telenko

Publishing Specialist/Distribution/Sponsors
Angela Parr

VegEdge is published 25 times per year, parallel to the production schedule of Western New York growers. Enrollees in the Cornell Vegetable Program receive a complimentary electronic subscription to the newsletter. Print copies are available for an additional fee. You must be enrolled in the Cornell Vegetable Program to subscribe to the newsletter. For information about enrolling in our program, visit cvp.cce.cornell.edu. Cornell Cooperative Extension staff, Cornell faculty, and other states' Extension personnel may request to receive a complimentary electronic subscription to VegEdge by emailing Angela Parr at aep63@cornell.edu. Total readership varies but averages 750 readers.

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.

Cornell University
Cooperative Extension
Cornell Vegetable Program

Contents

The next issue of VegEdge will be produced June 17, 2015.

New Technician Joins the Cornell Vegetable Program

Please join us in welcoming Missy Call to the Cornell Vegetable Program. She will be a full-time technician and will support the team's research and educational programs. Missy has an office at CCE Genesee County in Batavia, along with CVP Extension Aide, Elizabeth Buck, and Program Technician, Cordelia Hall. We've asked Missy to introduce herself:

"I am excited to join the Cornell Cooperative Extension Vegetable Program as a research technician! I recently graduated from Cornell University with a degree in Agricultural Sciences and minors in Plant Science and Ag Business. I am originally from the Batavia area and am looking forward to participating in the growth of the Ag Industry in Western NY." – Missy Call

not completely shut down over winter. High relative humidity is correlated with the disease which, given recent conditions, has favored the development in many local greenhouses/high tunnels.

Pruning is not a viable control option and there is very little (if any) cultivar resistance commercially available. Growers are reporting success with JMS Stylet Oil (available in organic or non-organic versions), sulfur products such as Microthiol Disperse and Inspire (difenoconazole 7D PHI). Do not apply Inspire to transplants.

Figure 2. Initial Powdery Mildew lesions on tomato. *Photo: Judson Reid, Cornell Vegetable Program*

Figure 3. Powdery Mildew (Oidium sp.) of high tunnel tomato. *Photo: Judson Reid, CVP*

Figure 4. Dried PM lesions on high tunnel tomato. Powdery Mildew spores on this tomato were controlled with Stylet oil. *Photo: Judson Reid, Cornell Vegetable Program*

Leafminer in Beet, Spinach, and Chard

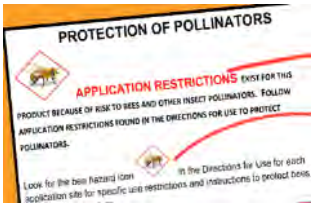
from Long Island Fruit and Vegetable Update, June 10, 2015

Leafminer damage was seen in spinach and beets recently; Swiss chard is also a host. Two fly species are likely culprits: spinach leafminer and beet leafminer. They also attack related plants (e.g. lambsquarters) and probably redroot pigweed. They pupate in the soil beneath plants or sometimes in the mines.

In small plantings remove mined leaves as soon as noticed along with alternate host weeds (look for plants with similar mines). Radiant, Entrust and azadirachtin materials can be used when mines are still small or preventively where there is a history. Other options include Brigade 2EC (spinach only, 40-day PHI), permethrin (Pounce, etc,; spinach and chard, 1-day PHI) and pyrethrins (Pyganic, Pyrenone, Pyronyl, etc.). (Note: Agri-Mek is labeled for other species of leafminers on spinach and chard). Row covers to exclude the flies may be most effective and practical on small plantings.

Check Neonicotinoid Insecticide Labels for Bee Advisory Boxes

U.S. EPA, Washington



In an ongoing effort to protect bees and other pollinators, the U.S. Environmental Protection Agency (EPA) developed pesticide labels that prohibit use of some neonicotinoid pesticide products where bees are present. The labels have a Bee Advisory Box and icon with information on routes of exposure and spray drift precautions. This affects products containing the neonicotinoids imidacloprid, dinotefuran, clothianidin and thiamethoxam. The U.S. Department of Agriculture (USDA) and EPA released a comprehensive scientific report on honey bee health, showing scientific consensus that there are a complex set of stressors associated with honey bee declines, including loss of habitat, parasites and disease, genetics, poor nutrition and pesticide exposure. The EPA recently released new enforcement guidance to federal, state and tribal enforcement officials to enhance investigations of beekill incidents. More on the EPA's label changes and pollinator protection efforts: http://www.epa.gov/opp00001/ecosystem/pollinator/index.html

CROP INSIGHTS

GENERAL OBSERVATIONS

With all the rain that came and for the rest that is predicted into next week, leaf diseases are the major concern as well as possible root rots for new transplants. It is time to look at getting on the preventative spray band wagon using such products as copper and Bravo to stay ahead of fungal and bacterial problems in tomatoes, peas, peppers, and vine crops. Be on the lookout for Early blight, Septoria, Angular leaf spot, bacterial spot, and anthracnose, to name a few.

Some of the field insect problems being seen include thrips being found on onions, cabbage, peppers, summer squash/zucchini, and cucumbers. Flea beetles vary in number and severity but generally are a problem across the area on kale, Brussels sprouts, and collards. Cucumber beetles have been light in some areas while heavy in others. Unprotected plants have been damaged heavily. Colorado potato beetle adults are very active and laying eggs on tomatoes and eggplants.

Leafminers have been showing up in the leaves of beets, Swiss chard, and some spinach – *see article, pg 3*. In the past, damage in the field has been pretty light while much heavier damage seen in high tunnels especially in the late fall. This season, maybe because of the cool spells and cold nights, more damage has been seen in the field.

Leafminer damage on leaf (left). Close-up of leafminer maggot (right). *Photos: AgUMass.edu*

CABBAGE & COLE CROPS

Planting has been delayed in the recent wet weather. Not much new to report pest-wise: flea beetles despite all the rain, cabbage maggot are thriving under these moist conditions, worm pressure appears to have naturally declined, and onion thrips are coming into cabbage.

DRY BEANS

Planting continued last week where fields dried out. Sites for Western bean cutworm (WBC) moth traps are needed in dry bean fields that are immediately adjacent to later planted field corn. Damage was found in dry beans at two elevators over the winter. By monitoring the population of WBC with the moth trap network we can estimate the risk of damage to dry beans, and alert growers of the need for an insecticide spray. Contact Carol MacNeil at crm6@cornell.edu or 585-313-8796.

ONIONS

The onion crop soaked up last week's rain and put on a lot of growth; now however, rainfall is becoming excessive and wet spots are starting to show up in fields. Not surprisingly with all of the leaf wetness, Botrytis leaf blight (BLB) has begun to show up, but at this time only the odd 4-leaf field has reached the spray threshold of 1 BLB lesion per leaf. It is expected that we'll have to start spraying for BLB next week. All the rain has kept onion thrips (OT) pressure down, but there are a couple of fields of transplanted onions located in areas notorious for early influxes that exceeded the spray threshold of 1.0 OT per leaf this week and have/will get sprayed with Movento. With the majority of direct seeded fields in the 2 to 4 leaf stage, this is the window for post-emergent herbicide sprays – see last week's article and an update on our Perennial sowthistle project on page … We've been very busy this spring conducting several onion herbicide trials and are planning to share our results at Onion Twilight Meetings in Oswego on June 23 and in Elba on July 1 – *see event posting, pg 10*.

POTATOES

Potatoes have really grown in the past week. A lot of hilling has occurred. There is still acreage to plant however. Heavy, continuing rains have taken their toll in some areas. More Colorado potato beetle (CPB) adults have emerged, and are feeding on volunteers and on potatoes not treated with systemic insecticide in-furrow or seed treatments.

If CPB resistance is "breaking through" your at-planting insecticide, or if you didn't use an at-planting insecticide but Neonicotinoid resistance is a problem, you may need a foliar insecticide if adult CPB populations are high. Avaunt + PBO (piperonyl butoxide at 0.25 lb active ingredient/acre) is recommended, according to Russ Groves, U WI Entomologist. Beetles stop feeding but take a few days to die. (ALL insecticide seed or in-furrow treatments are Neonicotinoids, either imidacloprid or thiamethoxam.)

If you did not use an insecticide on the seed or in-furrow, Neonicotinoid resistance is not a problem on your farm, and CPB adults are present at high levels you have choices for control. Neonicotinoid insecticides (active ingredients imidacloprid, thiamethoxam or acetamiprid) are effective against CPB, if resistance isn't present. Assail, Admire Pro and generics, and Actara are possibilities, or the non-neonicotinoid insecticide Coragen. If you use one of these materials then do not use any neonicotinoid-containing, or chlorantraniliprole-containing, insecticides on subsequent larval generations.

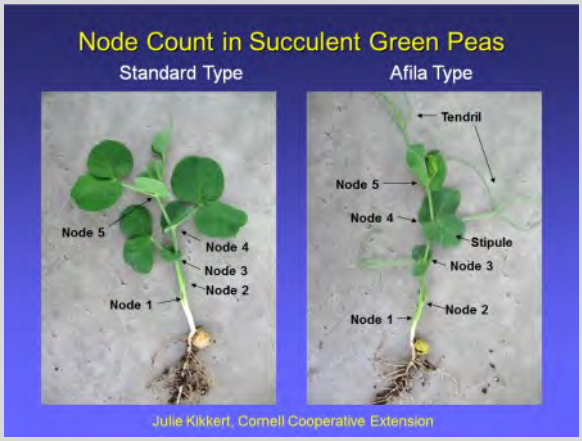
There is no OMRI approved insecticide that is effective against adult CPB for organic growers. Egg hatch to the small larval stage is the target for applying Entrust or azadirachtin/neem formulations. Do not apply Entrust more than twice consecutively, or on more than 1 larval generation, or the development of resistance is likely. Dow AgroSciences has threatened to pull the product from the Northeast to prevent that from happening. For other choices against the CPB at egg-hatch/small larval stage see Insect Management at: http://nysipm.cornell.edu/organic_guide/potato.pdf Always check with your organic certifier before spraying.

continued on next page

continued - CROP insights

PROCESSING CROPS

Wet soils across the region continue to delay planting, as well as herbicide applications to crops that have emerged. Post-emergence herbicides need to be applied at the correct stage of crop growth to avoid crop injury. This is especially important for peas. Most products refer to the number of nodes in a pea plant. A node is a point on a stem where a leaf is or has been attached. When a pea seed germinates, the cotyledons remain below the soil surface (see figure). The shoot grows upward. The first two nodes have incomplete or stipular leaves. Beginning with the third node, the pea plant has a compound leaf comprised of two fleshy stipules at the base, a petiole (leaf stalk) with two or three pairs of leaflets, and usually several tendrils at the end. When counting nodes, it is very important to remember that one or several nodes may be below the soil surface depending on how deep the seed was planted. Thistrol and Raptor herbicides cannot be applied within a certain number of nodes to flowering. Early varieties can flower as soon as 9 nodes. The first node to flower for many of the processing varieties to be grown in 2015 is listed in the table below.



The average node to first flower for commonly grown processing pea varieties in New York.

Variety	Vine type	1st node to flower
Early Season		
Spring	Normal	9 to 10
Salinero	Normal	9 to 10
Mid-Season		
Portage	Afila	10
Gusty	Afila	10 to 13
CMG 416AF	Afila	10 to 11
Late-Season		
Bolero	Normal	14 to 15
Grundy	Normal	16
Ricco	Afila	16
Spartan	Afila	12 to 14
FP 2278	Afila	15

New Proposal to Protect Bees from Toxic Pesticides (Comment by 6/29)

From EPA's Office of Pesticide Programs, www.epa.gov/pesticides (edited by C. MacNeil, CVP)

EPA is proposing to prohibit the applications of pesticides that are highly toxic to bees when crops are in bloom and bees are under contract for pollination services. These restrictions would prohibit application of most insecticides and some herbicides during bloom. Growers routinely contract with honey bee keepers to bring in bees to pollinate their crops that require insect pollination. Bees are typically present during the period the crops are in bloom. Application of pesticides during this period can significantly affect the health of bees. These restrictions are expected to reduce the likelihood of high levels of pesticide exposure and mortality for bees providing pollination services. At this time, EPA is not proposing changes to product labels for managed bees not being used for pollination services. The proposed restrictions would apply to all products that have:

- Liquid or dust formulations as applied;
- Foliar use (applying pesticides directly to crop leaves) directions for use on crops; and
- Active ingredients that have been determined via testing to have high toxicity for bees.

The proposed restrictions would not replace more restrictive, chemical-specific, bee-protective provisions that may already be on a product label. Additionally, the proposed label restrictions would not apply to applications made in support of a government-declared public health response, such as for mosquito control. There would be no other exceptions. *(Current neonicotinoid product labels include a 48-hour notification exception to the bloom prohibition. However, as part of this new mitigation proposal, the 48-hour notification exception for crops under contracted pollination services during bloom for all neonicotinoid product labels would be removed.)*

The list of registered active ingredients that meet the acute toxicity criteria is included in Appendix A of EPA's proposal. Seventy-six pesticide active ingredients, both newer and older pesticides, conventional and organic pesticides, are included. See Appendix A at the end of EPA's Proposal to Mitigate Exposure to Bees from Acutely Toxic Pesticide Products at: http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPP-2014-0818-0002 Click on the *pdf* icon to open the document and scroll down to page 17.

If EPA receives evidence during the public comment period that acutely toxic pesticide risks to bees are addressed through existing, and widely used, beekeeper-to-grower contract language, please comment. Any such factor may allow EPA to reconsider the mitigation for this scenario.

EPA invites comments on the proposal for the thirty-day comment period ending June 29, 2015 at: www.regulations.gov in docket EPA-HQ-OPP-2014-0818

Read about other actions EPA is taking to protect pollinators: http://www2.epa.gov/pollinator-protection/epa-actions-protect-pollinators

In-Season Management of Perennial Sowthistle in Direct Seeded Onions: How to Out-Smart this Weed!

Christy Hoepting, CCE Cornell Vegetable Program

Perennial sowthistle has become a serious weed problem in some muck fields where onions are grown. This perennial weed reproduces by seed, but most importantly by specialized horizontal underground stems, called rhizomes. Rhizomes can grow about 6 feet in a single growing season with several new plants being produced along its length (Fig. 1). The rhizomes easily over-winter and produce new shoots first thing in the spring. When uncontrolled, perennial sowthistle can significantly reduce yield up to 70% or more and reduce bulb size from jumbos to smalls and boilers, as well as interfere with harvest practices.

The standard herbicides used in onion production do not control Perennial sowthistle. Standard cultivation practices spread the rhizomes across fields and hand-weeding can exacerbate the problem because it stimulates the parent rhizome to produce several more shoots. Burndown programs including growth regulator(s) implemented in the fall require 6-8 weeks after onion harvest and before a hard frost to allow enough time for the thistle to re-grow to the susceptible stage for adequate herbicide uptake and to achieve effective kill following application of burndown herbicides. Unfortunately, in NY this timing is only feasible in less than 10% of the onion acreage on muck soils. Having an effective strategy to manage perennial sowthistle is in-season is critical.

Beginning in 2013, Hoepting and Buck began field research with the growth regulator-type herbicide Stinger with the active ingredient, clopyralid to develop a program to effectively manage Perennial sowthistle in direct seeded onions.

During the first year of study, key strategies for managing Perennial sowthistle with Stinger were identified:

1) The most susceptible stage of Perennial sowthistle to Stinger is the mid- to late-rosette stage (Fig. 2). Younger and older stages (bolting and larger) tend to recover and outgrow injury.
2) Out of single applications of 4, 6, 8 and 12 fl oz rates of Stinger made at the mid-rosette stage, 8 fl oz resulted in the highest level of mortality and severely injured thistles.
3) Multiple applications of lower doses of Stinger were more effective than a single application of the highest dose.
4) The most effective treatment that provided season-long control of Perennial sowthistle including 94% control of ground cover and 99% control of weed biomass was Stinger 8 fl oz at the mid-rosette stage, followed by 4 fl oz applied 2 and 4 weeks later (Stinger 8-4-4).
5) The most tolerant crop stages to 8 fl oz of Stinger were between 4- and 6-leaf. Stinger caused serious and unacceptable injury when applied to onions once they started bulbing. Applications to the 2-leaf stage resulted in slightly more injured bulbs and reduced yields.

Figure 1. Rhizomes of perennial sowthistle can grow about 6 feet in a single growing season with several new plants being produced along its length. *Photo: C. Hoepting, Cornell Vegetable Program*

Figure 2. Perennial sowthistle in the mid-rosette stage in a crop of 2-leaf onions. *Photo: C. Hoepting, CVP*

The Challenge:

Going into the second year of study in 2014, the major challenge was that the most susceptible stage of Perennial sow thistle (mid- to late-rosette) generally occurs when direct seeded onions are at the 2-leaf stage (Fig. 2), which are as tolerant as we'd like to the most effective rate of Stinger (8 fl oz), which we'd like to use to achieve best control of the thistle. To avoid risk of crop injury, we dropped the maximum rate of Stinger from 16 fl oz to 12 fl oz, which was to be applied in two applications instead of three with the last application to be applied no later than the first week in July. Fortunately, we identified a few different management strategies that show potential to effectively manage Perennial sow thistle without causing unacceptable injury to the onion crop. In the 2014 study, bulb injury was less than 2% in all of the treatments at harvest.

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Figure 3. Nortron alignment with Stinger 8-4 followed by Norton hold to control Perennial sowthistle: Norton 16 fl oz @ 2-leaf + Stinger 8 fl oz @ 4-leaf + Stinger 4 fl oz @ 5-leaf + Norton 16 fl oz @ 7 & 9-leaf. This proved to be one of the most effective, safest and economical treatments in the 2014 trial. *Photo: C. Hoepting, Cornell Vegetable Program*

Hand weeding vs. "Nortron hold". We had a couple of treatments where we compared following Stinger 8-4 with hand weeding as needed (which ended up being two times) to a "Nortron hold", where we applied 2 applications of Nortron 16 fl oz two weeks apart. Stinger 8-4 + hand weeding 2x resulted in 90% control of ground cover and 99% control of weed biomass compared to the untreated. Stinger 8-4 + Nortron 16 fl oz 2x resulted in 53% control of ground cover and 81% control of weed biomass. Interestingly, Stinger 8-4 + hand weeding 2x resulted in a significant 28% reduction in yield, while Stinger 8-4 + "Nortron hold" had no yield reduction, compared to the hand weeded check. Since yield reduction was not a consequence of unmarketable bulb injury, we suspect that the combination of hand weeding and Stinger can take its toll on the onions. In our Stinger crop tolerance study, we observed that Stinger can cause root swelling and stubbiness, which makes the plants more prone to being uprooted during hand weeding. Even if the plants aren't pulled completely out of the ground, their roots can still tare and break. Our Nortron alignment treatment followed by a Nortron hold ended up being one of the most effective, safest and most economical treatments in the trial (Fig. 3).

Research Identifies Four Possible Strategies to Control Perennial Sowthistle:

1) **Stinger 4-8 start @ 2-leaf.** For this strategy, we timed our first Stinger application to the most susceptible weed stage (mid-late rosette stage), but since the onions were only in the 2-leaf stage, we started with only 4 fl oz of Stinger, because this rate was much safer than 8 fl oz at this leaf stage. We waited until the onions reached the 4-leaf stage and the injured thistles began to recover before we came back and applied 8 fl oz of Stinger. Two weeks after the second Stinger application, 46% of the weeds were dead, 51% were injured and less than 3% were actively growing. We had no yield reduction with this treatment compared to the hand weeded check.

2) **Chateau Alignment with Stinger 8-4 start 4-leaf.** For this strategy, we applied Chateau 2.0 oz when the onions were at the 2-leaf stage and the sowthistle was in the mid- to late-rosette stage. The Chateau did a decent job of burning back the sowthistle and even killed some of the early rosettes. One week later when the onions were in the 4-leaf stage we applied 8 fl oz of Stinger when the onions were most tolerant to this high rate of Stinger and then followed that with 4 fl oz of Stinger one week later when the onions were in the 5-leaf stage. Two weeks after the second Stinger application, 22% of the weeds were dead, 71% were injured and 3% were actively growing. Eventually, the injured weeds recovered and we were disappointed with the overall control. In retrospect, we believe that had we applied Stinger 8 fl oz 2 weeks instead of only a week after the Chateau application we would have gotten very good control. This would have allowed the injured weeds to begin to re-grow after the Chateau injury in order to effectively take up the Stinger. We had no yield reduction with this treatment compared to the hand weeded check.

3) **Nortron Alignment with Stinger 8-4 start 4-leaf.** Nortron is an herbicide that is labeled in onions for pre- and post-emergent broadleaf weed control in other states, but not New York. Although, it is possible that it could get a label in New York on onions. In our first year of study, we trialed Nortron against perennial sowthistle and noticed that it held it back about 50% compared to the untreated. For this strategy, we applied Nortron 16 fl oz when the onions were at the 2-leaf stage and the sow thistle was in the mid- to late-rosette stage. The Nortron did not injure the perennial sowthistle, but rather it stunted its growth holding it in the susceptible stage until the onions reached the 4-leaf stage, when we applied Stinger 8 fl oz. Another 4 fl oz of Stinger was applied one week later. Two weeks after the second Stinger application, 75% of the weeds were dead, 25% were injured and only 1% were actively growing. We also had no yield reduction with this treatment compared to the hand weeded check.

4) **Hand weed at 1-leaf with Stinger 8-4 start 4-leaf.** For this strategy, we hand weeded the perennial sowthistle when the onions were in the 1-leaf stage and then allowed them to re-grow to the mid-rosette stage when the onions were in the 4-leaf stage when we applied Stinger 8 fl oz, and then 4 fl oz 2 weeks later. Two weeks after the second Stinger application, 31% of the weeds were dead, 52% were injured and 26% were actively growing. With such a high proportion of actively growing weeds, overall control ended up being mediocre. In retrospect, we should have waited another week to apply the Stinger 8 fl oz, because although some of the weeds were in the mid-rosette stage, the majority were younger and not as effected by the Stinger. This treatment also resulted in a significant 22% reduction in yield compared to the hand weeded check. Since we did not find bulb injury, we speculate that hand weeding at the 1-leaf stage was disruptive to the onions, which contributed to the yield reduction.

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Next Steps:
The problem lies in that Stinger is not labeled for use on onions, not in New York, and not anywhere. To overcome this, Hoepting submitted a request to add onions to the Stinger label to IR-4, which is a federally funded resource for supplying pest management tools for specialty crop growers. With the support of the manufacturer of Stinger, the request was accepted and Stinger is now in the IR-4 program as a high research priority with field trials starting this year. The IR-4 program will provide funding to develop the research data required to support this new product use in a minor crop, specifically, residue and crop tolerance studies. Such studies will prove that the proposed usage of a pesticide does not result in unacceptable residues in the harvested produce or harm to the crop. It will take about 3-4 years before we see Stinger labeled in onions. We will also pursue the possibility of getting a label for Nortron in onions in NY this fall. Hopefully, in the near future, onion growers will have all the tools they need to economically control a once unmanageable and devastating weed.

In the meantime, other strategies to manage Perennial sowthistle include:

- ***Hand weeding:*** ideally, perennial sowthistle should be weeded every time it reaches the early bolt stage. We've noticed that once the plants bolt and flower that the resurgence of new growth is fierce, and hand weeding actually makes the infestation even worse.
- ***Chemical burndown in the fall:*** Growers would have to strategically plant an early maturing variety in a field where they would like to implement a fall burn down to accommodate the 6-8 week window after harvest that is required for this strategy to be effective.
- ***Sanitation:*** Keep ditch banks and hedge rows clean of perennial sow thistle. Do not let it go to seed. Be mindful that rhizomes can be transported on equipment and subsequently introduced to a new field. Power wash equipment after working or harvesting an infested field.

Late Blight Risk

Carol MacNeil and John Gibbons, CCE Cornell Vegetable Program

Most weather stations have reached, or will reach within the next week, the 18 late blight (LB) severity values (SV) that trigger the first fungicide application on field tomatoes and on potatoes 4+ inches tall. A few stations are well past that point. If you are using the Arkport, Elba or Gainesville stations as a guide to timing fungicide applications, note that 18 SVs was reached over a week ago and the second or third spray should go on soon, based on the LB Decision Support System (DSS) Simcast forecast (*Simcast* in chart below) for later sprays. Recent wet weather has been extremely favorable for the development of LB. In eastern Allegany/western Steuben Counties be sure to scout emerging potato sprouts and tomato stems for possible symptoms of LB from overwintered oospores (see photos).

For photos of LB: http://livegpath.cals.cornell.edu/gallery/tomato/tomato-late-blight/

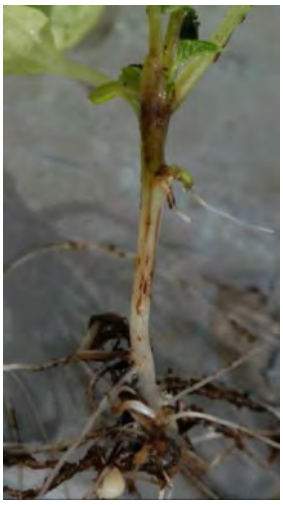
For a video distinguishing LB from other diseases: https://www.youtube.com/watch?v=aA4PuEKaQpY

Check your potato cull piles NOW to be sure they're covered with at least 2 ft. of soil! Culls need to be buried, fed to livestock, etc. ASAP so they don't serve as a source of LB for your potato or tomato crop.

For those using the DSS, be sure to *Input* and *Submit* the first fungicide applied. Simcast, the custom forecast for your farm, crops, and spray practices, will then automatically begin. Sign up for DSS *Alerts*! If you have questions contact Carol MacNeil at crm6@cornell.edu or 585-313-8796.

Dennis Johnson, Plant Pathologist, Washington State University, has done research documenting LB originating from infected tubers, *Source of Late Blight Epidemics*, 5/18/15. His photos appear to the right. While they show infection from infected tubers, infection from oospores in the soil may look similar.

Sporulation (fine white fuzz) of LB on right side of stem, just above the soil line from LB infected see. *Photo: D. Johnson, Washington State Univ.*



Streaking of reddish brown tissue on the stem where LB moved internally from an infected seed piece. *Photo: D. Johnson, Washington State Univ.*

Late Blight Severity Values* 6/09/15

Location**	Week	Total	Location	Week	Total
Appleton	3	5	Lockport	NA	NA
Arkport	**Simcast**		Lodi	3	15
Baldwinsville	5	15	Lyndonville	NA	NA
Bergen	3	12	Medina	5	13
Buffalo	5	21	Ovid	3	15
Butler	8	18	Penn Yan	9	27
Ceres	7	21	Rochester	5	19
Elba	**Simcast**		Silver Creek	2	10
Farmington	1	10	Sodus	1	11
Gainesville	**Simcast**		Versailles	NA	NA
Geneva	4	13	Wellsville	**Simcast**	
Kendall	5	13	Williamson	4	14

* Severity value accumulations start 5/13/2015

WNY Sweet Corn Trap Network Report, 6/9/15

Marion Zuefle, NYS IPM Program; http://sweetcorn.nysipm.cornell.edu

Ten sites reporting this week with European corn borer (ECB)-E caught at 4 sites and ECB-Z caught at 5 sites. Numbers remain low for both races. Peak ECB-E flight occurs at approximately 631 degree days modified base 50. This will most likely occur at several sites within the next week (see degree days for each site in table below). Accumulated degree days for the 25 trap network sites range from 395 to 602 with an average of 516 modified base 50F. Three sites are reporting corn earworm (CEW) with two sites, Eden and Spencerport, with trap catches high enough to be on a 5 and 6 day spray interval respectively. Western bean cutworm (WBC) traps have been deployed at several locations but no moths have been caught to date.

European corn borer (bivoltine) development estimated using a modified base 50F degree day calculation.

Development Stage	Accumulated Degree Days
First Generation	
First spring moths	374
First eggs	450
Peak spring moths	631
First generation treatment period	800-1000
Second Generation	
First summer moths	1400
First eggs	1450
First egg hatch	1550
Peak summer moths	1733
Second generation treatment period	1550-2100

From J. W. Apple, Department of Entomology, University of Wisconsin-Madison

Average corn earworm catch			
Per Day	**Per Five Days**	**Per Week**	**Days Between Sprays**
<0.2	<1.0	<1.4	No Spray (for CEW)
0.2-0.5	1.0-2.5	1.4-3.5	6 days
0.5-1.0	2.5-5.0	3.5-7.0	5 days
1-13	5-65	7-91	4 days
over 13	over 65	over 91	3 days

Add one day to the recommended spray interval if daily maximum temperatures are less than 80°F for the previous 2-3 days.

WNY Pheromone Trap Catches: June 9, 2015

Location	ECB -E	ECB -Z	CEW	FAW	WBC	DD to Date
Baldwinsville (Onondaga)	NA	NA	NA	NA	NA	549
Batavia (Genesee)	0	0	0	0	0	396
Belfast	0	0	0	0	0	502
Bellona (Yates)	NA	NA	NA	NA	NA	603
Eden (Erie)	0	1	7	0	0	497
Farmington (Ontario)	4	0	0	0	0	517
Hamlin (Monroe)	NA	NA	NA	NA	NA	504
LeRoy (Genesee)	NA	NA	NA	NA	NA	467
Lockport (Niagara)	1	1	0	0	0	480
Pavilion	NA	NA	NA	NA	NA	467
Penn Yan (Yates)	0	3	1	0	0	574
Seneca Castle (Ontario)	1	2	0	0	NA	524
Spencerport (Monroe)	0	3	2	0	NA	587
Waterport (Orleans)	NA	NA	NA	NA	NA	504
Williamson (Wayne)	NA	NA	NA	NA	NA	466

ECB - European Corn Borer
CEW - Corn Earworm
FAW - Fall Armyworm
WBC - Western Bean Cutworm
NA - not available
DD - Degree Day (modified base 50F) accumulation

Scouting of bare ground sweet corn should begin when the tassel starts to emerge. When scouting focus on the emerging tassel. Separate the leaves and look down into the tassel for any signs of feeding, frass or larvae. To help you scout your fields please view the video titled How to Scout Fresh Market Sweet Corn.

ECB frass in emerging tassel.

ECB larva on tassel.

Has Nitrogen Been Lost?

Anne Verhallen, Soil Specialist, Ontario Ministry of Ag, Food & Rural Affairs (from http://onvegetables.com, 6/1/15); Edited by C. MacNeil, CVP

After heavy rains and wet soil conditions, questions come up: Is the nitrogen (N) still there? Should I add more? The amount of N lost depends upon the amount that was in the nitrate form during the period of heavy rain/saturated soil. Ammonium N is held by the cation exchange complex and is not lost. The conversion of ammonium N to nitrate N is naturally a rapid microbial process at warm temperatures, but is interrupted when the soil is saturated. Nitrate N however can be lost through leaching and denitrification.

Nitrate leaching is the downward movement of nitrate anions through the soil profile, since nitrate is not held by the soil. As more rainwater enters the soil it displaces water already in the soil pushing it downward, carrying the nitrate with it. So how far has the nitrate leached? Work from the Cornbelt suggests that on silt loam or silty clay loam soils, an inch of water entering the soil (only part of the rain soaks in as some runs off) will only move nitrate down about 6 inches, due to the high water holding capacity of these soils. However, on a sandy soil an inch of water can move down a foot. Deeper

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rooted crops like established tomatoes and corn have the ability to recapture this nitrate if growing conditions are good, and if compaction doesn't limit rooting depth.

Of more concern is denitrification, if soils stay wet. Denitrification refers to the microbial process of soil bacteria using nitrate as an oxygen source when the soil is saturated and oxygen levels are low. When oxygen is taken from the nitrate in soil, nitrogen or/and nitrous oxide gas is produced and released to the atmosphere. The rate of denitrification is influenced by temperature, soil pH, energy sources (carbon), etc. There has been some research done to quantify the amount of denitrification that can occur, however the work was done primarily in the Corn-belt so it is a very rough guide. Keep in mind that this refers to **clay loam** and **silt loam** soils that are saturated.

In University of Illinois research, if the soil temperature was less than 55 degrees F denitrification losses were 1-2% N per day when soil was saturated; from 55-65 degrees F losses were 2-3% per day; and over 65 degrees F losses were 4-5% per day.

Lighter soils often drain reasonably well and don't stay wet very long, but many of the heavier soils may remain wet several days. If denitrification is a concern, consider carefully the crop condition, field topography, amount and type of fertilizer and additives applied, and the rainfall pattern, before deciding to add more nitrogen.

(A rule-of-thumb in the past has been that a 3-4 inch rainfall will result in a loss of N, and thus a need for a 30-40 lb/acre sidedress on many vegetables. If a legume like red clover preceded this year's crop, or if manure was applied last fall, then a sidedress would likely not be needed. Keep in mind that excess N can make vegetables more susceptible to some diseases, and can delay maturity in potatoes. Adapt-N at http://www.adapt-n.com/ is a Cornell program that takes into account local New York State soil types, rainfall, individual field location and grower's production practices, to make custom recommendations on in-season nitrogen applications for field corn. ed. C. MacNeil, CVP)

UPCOMING EVENTS *view all Cornell Vegetable Program upcoming events at cvp.cce.cornell.edu*

Fresh Market Vegetable Weed Management Field Days: Cultivation Options

June 22, 2015 | 4:00 - 7:45 PM
Fenton's Produce LLC, 3323 Pratt Rd, Batavia, NY 14020

Research and Extension Educators will be leading demonstrations and answering questions on cultural and mechanical weed management options for fresh market vegetable growers. Attendees will see demos of new cultivation equipment in vine crops, beans, cabbage, and lettuce. Growers will learn what equipment is right for their farm and how to set-up (common equipment sweeps/shanks). CCA and DEC credits will be available. Register and pay online, or 716-652-5400 and pay at the door. For more info, call Darcy Telenko at 716-697-4965.

Fresh Market Vegetable Weed Management Field Days: Weed Management in Vegetable Production

June 23, 2015 | 8:30 AM - 3:30 PM
CVP Weed Management Demo Site at Partridge's on the Farm Market, 4924 Ellicott St Rd (Rt 63), Batavia, NY 14020

Research and Extension Educators will be leading demonstration site tours and answering questions on cultural and mechanical weed management options for fresh market vegetable growers. Equipment options and considerations will be discussed and industry representatives will be on-hand to comment on their products. Topics include:

- Weed Management Between the Rows
- Weed Identification and Biology
- Tillage Options for Weed Management
- Essential Weed Management Equipment for the Beginning Farmer
- Herbicide Options in Sweet Corn
- Herbicide Injury Demo
- Perennial Bed Row Cover

CCA and DEC credits will be available for portions of the day. Register and pay online, or call 716-652-5400 and pay at the door. We request pre-registering for the event so that we have a lunch count. For more info, contact Darcy Telenko at 716-697-4965.

Oswego Onion Weed Meeting

June 23, 2015 – Contact Christy Hoepting for details at cah59@cornell.edu or 585-721-6953.

2015 Elba Onion Weed Twilight Meeting

July 1, 2015 | 5:30 PM - 8:00 PM
in the Elba Muck

Nothing but weed control results and demonstrations. 1.75 DEC credits available. Contact Christy Hoepting at cah59@cornell.edu or 585-721-6953 for details.

Weather Charts

John Gibbons, CCE Cornell Vegetable Program

Weekly Weather Summary: 6/02 – 6/08/15

Location	Rainfall (inch)		Temp (°F)	
	Week	Month	Max	Min
Albion	0.46	0.95	83	40
Appleton, North	0.78	0.94	75	39
Baldwinsville	0.61	1.26	81	43
Buffalo*	0.31	0.45	80	46
Butler	0.92	1.51	83	40
Ceres	1.12	1.14	80	36
Elba	1.09	1.53	80	39
Farmington	1.53	1.74	79	37
Gainesville	0.29	0.39	79	36
Geneva	1.20	1.43	79	42
Lockport	0.64	0.88	80	41
Lodi	0.79	1.01	81	40
Penn Yan*	0.98	1.37	79	44
Rochester*	1.02	1.81	82	43
Romulus	0.86	1.10	79	42
Silver Creek	0.65	0.62	79	43
Sodus	1.60	2.43	79	36
Versailles	NA	NA	81	43
Williamson	0.96	1.88	78	40

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 – June 8, 2015

Location	2015	2014	2013
Albion	526	417	479
Appleton, North	399	310	369
Baldwinsville	549	505	490
Buffalo	543	417	543
Butler	567	487	NA
Ceres	454	387	394
Elba	396	324	434
Farmington	517	453	453
Gainesville	412	337	NA
Geneva	524	471	513
Lockport	480	383	NA
Lodi	606	533	566
Penn Yan	574	496	523
Rochester	587	492	563
Romulus	535	475	NA
Silver Creek	472	385	498
Sodus	449	433	NA
Versailles	497	411	527
Williamson	466	415	459

* 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

480 North Main Street
Canandaigua, NY 14424

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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.

VEGETABLE SPECIALISTS

Robert Hadad | 585-739-4065 cell | rgh26@cornell.edu
food safety & quality, organic, business & marketing, and fresh market vegetables

Christy Hoepting | 585-721-6953 cell | 585-798-4265 x38 office | cah59@cornell.edu
onions, cabbage and pesticide management

Julie Kikkert | 585-313-8160 cell | 585-394-3977 x404 office | jrk2@cornell.edu
processing crops (sweet corn, snap beans, lima beans, peas, beets, and carrots)

Carol MacNeil | 585-313-8796 cell | 585-394-3977 x406 office | crm6@cornell.edu
potatoes, dry beans, and soil health

Judson Reid | 585-313-8912 cell | 315-536-5123 office | jer11@cornell.edu
greenhouse production, small farming operations, and fresh market vegetables

Darcy Telenko | 716-697-4965 cell | 716-652-5400 x178 office | dep10@cornell.edu
soil health, weed management, plant pathology

PROGRAM ASSISTANTS

Elizabeth Buck | 607-425-3494 cell | emb273@cornell.edu

Missy Call | mmc253@cornell.edu

John Gibbons | 716-474-5238 cell | jpg10@cornell.edu

Cordelia Hall | ch776@cornell.edu

Nelson Hoover

ADMINISTRATION

Angela Parr | 585-394-3977 x426 office | aep63@cornell.edu

Steve Reiners | sr43@cornell.edu

Mark Giles | fmg4@cornell.edu

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

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Cornell Vegetable Program