Cornell Cooperative Extension | Cornell Vegetable Program

VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Volume 15 • Issue 22 • September 18, 2019

Preparing for the Cold

PAGE 1

Post-Harvest Pesticide Applications for Potatoes in Storage

PAGE 3

Monitoring Susceptibility of Onion Thrips to Radiant SC

PAGE 6

Identifying Palmer Amaranth and Waterhemp

PAGE 10

Preparing for the Cold

Robert Hadad, CCE Cornell Vegetable Program

Warm temperatures going into late September into October can really help the financial bottom line for fresh market growers still harvesting late into the season. The forecast for the end of this week could push temperature up into the 80sF and the following week is predicted to still be mild.

Now is a good time to think about frost protection. Despite seemingly decent fall growing conditions our region has been enjoying, the chance of the first frost lingers. It is frustrating to have a period of decent weather interrupted by one early morning drop in temperature with a frost or freeze that nips the more tender crops followed by another month of mild conditions.

Preparing for the frost or freeze event may be worth the time and investment if you have significant amounts of crops in the field that could be damaged. Tomato, pepper, eggplant, squash, and some of the greens can be injured with temperatures below 36°F. Cold temperatures as well as a frost can damage the surface of fruiting vegetables.

Tall tubing hoop. *Photo: Robert Hadad, CCE Cornell Vegetable Program*

continued on page 3

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

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

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

Web address: cvp.cce.cornell.edu

Contributing Writers
Elizabeth Buck
Robert Hadad
Christy Hoepting
Margie Lund
Julie Kikkert
Judson Reid

Publishing Specialist/Distribution/Sponsors
Angela Ochterski

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 Ochterski at aep63@cornell.edu. Total readership varies but averages 700 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.

Contents

Contact Us
Cornell Vegetable Program 12

Crops
CROP Insights – Our Observations from the Field 08
Post-Harvest Pesticide Applications for Potatoes in Storage 03
Potato/Tomato Late Blight Risk 04
Late Season Insect Pressure in Dry Beans 05
Monitoring Susceptibility of Onion Thrips to Radiant SC 06
NY Sweet Corn Trap Network Report, 9/17/19 07
Wrong vs. Wrong in Onions 09

General
Preparing for the Cold 01
Identifying Palmer Amaranth and Waterhemp 10

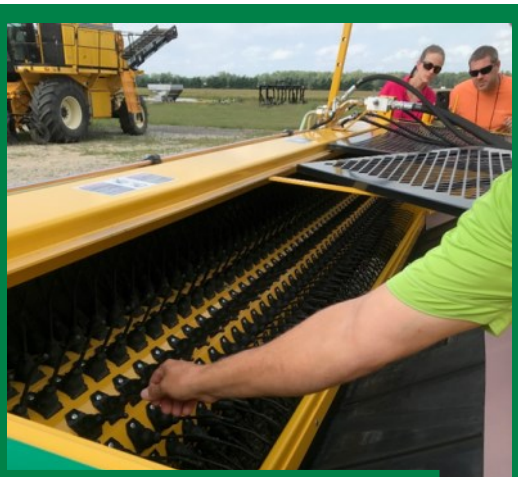
Weather Charts 11

The next issue of VegEdge newsletter will be produced on October 1.

Head of a brand new snap bean harvester, photographed by Julie Kikkert, Cornell Vegetable Program, while on tour at the Oxbo Company sales office in Shipshewana, IN.

Right: Picking reel fingers behind the roller.

Below: Front of harvester showing the plant aligning brushes and roller that direct the plants and unpicked beans into the picking head.



continued from cover – Preparing for the Cold

Investing in row cover and frame material can be useful. Remembering that floating row cover laying on top of plants doesn't protect the plant parts touching the cover. The row cover must be draped over a frame to offer best protection. The thickness of the row cover material impacts protection. The light weight covers offers a few degrees of protection while the heavier grades protect plants from lower temperatures. The more protection, the higher the purchase cost.

Frames can be simple. Hoops bent over plant rows/beds made from PVC plumbing tubing or metal electrical conduit are available at most hardware stores or box stores. These can make hoops about 36-40" tall. Using a hammer and stake to make holes to place the ends of the tubing to go over the crop rows holds the frame in place. Tying each hoop to each other down the row by running a rope from hoop center to the next offers some rigidness against wind. Sandbags, metal rerod, or rocks can hold down the edges of the row cover. Shorter spring steel hoops can be purchased from local farm supply stores for low growing vegetables.

Use the covers when predictions of cold temperatures are predicted for keep them on more tender crops to help keep the warmth closer to the plants during the day to help with ripening. Windy conditions may warrant removing the covers to protect them from tearing or being blown away.

Looking at historical weather data for WNY is one way of getting an idea what the chances are for early frost/freeze in your area. The NOAA has compiled 30 years of data to create predictions based on temperatures and the chance that these temperatures will occur before that date. https://www.ncdc.noaa.gov/cgi-bin/climatenormals/climatenormals.pl?directive=prod_select2&prodtype=CLIM2001&subrnum%2520to%2520Freeze/Frost%2520Data%2520from%2520the%2520U.S.%2520Climate%2520Normals For example, the 10% probability the temp would be below 32°F in and around Albion (Orleans Cty) the date given is Sept 20. The probability of a date where the first frost will occur increases to 50% before Oct 1. The 90% probability that the first frost would occur comes before Oct 13. So in other words a real early frost could occur this week while having a 50-50 chance of the frost occurring the closer to the first of October. If you are a gambler, that frost date might occur later into the month.

The data also gives the probability of cold temperatures at 36°F and the freeze temperature of 28°F. Areas located north of the thruway tend to have later dates and areas closer to the lakes are more protected still. Heading south of the thruway and in and around the hills and valleys, the cold temp dates come earlier.

So you've got to ask yourself, "do I feel lucky" and gamble with the temperature staying above freezing or will you be prepared and take precautions? The choice is up to you.

Low tunnel hoops. *Photo: R. Hadad, CVP*

Covered hoops. *Photo: R. Hadad, CVP*

Post-Harvest Pesticide Applications for Potatoes in Storage

Margie Lund, CCE Cornell Vegetable Program

With potato harvest underway, it is time to consider what chemicals may be needed just prior to or post-harvest to help control disease problems in tubers going into storage. While there are not options available for all diseases present during storage, many diseases have control options including sprays during vine-kill or post-harvest applications. This guide provides information for those options that are available.

Bacterial Soft Rot

Bacterial pathogen that can cause soft rot of tubers. Avoid injuries to tubers during harvest, and avoid harvesting tubers when soil is above 70 F. Chlorine wash treatments can help prevent the spread of bacteria. Additionally, providing optimal conditions for wound healing (55-60 F, 95% RH, good ventilation) can help decrease the spread.

- AgClor 310 (*sodium hypochlorite*; Group NC) – Rate: 65-125 ppm/A – Postharvest application. Add to wash water (water similar temperature to potato, pH between 6 and 7.5). Follow label instructions.

Fusarium Dry Rot

Fungus that causes dry rot in stored tubers and seed piece decay. Tubers appear sunken and shriveled in areas on the surface, and rot may extend to the center of the tuber containing a fungal growth that can be pink, white, or yellow. Harvest tubers after skin is set and when pulp temperature is above 50 F. Avoid injuries at harvest, and provide optimal conditions for wound healing. Avoid unnecessarily moving tubers during storage as this can create new wounds that can become infected.

- Stadium (*azoxystrobin* + *fludioxonil* + *difenoconazol*; Group 11 + 12 + 3) – Rate: 1 fl oz/2000lbs – Post-harvest

continued on page 4

continued from page 3 – Post-Harvest Pesticide Applications for Potatoes in Storage

spray (not for use on seed pieces). Tubers should be tumbling during treatment to ensure proper coverage.

- Bio-Save 10LP (*Pseudomonas syringae*; Group NC) – Rate: 500 g/30 gal – Apply to tubers on conveyor belt or rollers by dip or spray prior to storage. Agitate mixture to ensure proper suspension. Uniform coverage is necessary. Quantity will treat 3000 cwt.
- Decco Salt No. 19 (*thiabendazole*; Group 1) – Rate: 5.67 g/2000 lbs – Apply postharvest. Mist unwashed tubers on grading belt.
- Mertect 340F (*thiabendazole*; Group 1) – Rate: 0.42 fl oz/2000 lbs – Apply uniformly in a fine mist with water to each ton of potatoes as tubers pass over a bin loader. Do not apply to cut tubers.

Late Blight

Fungal-like pathogen that causes infected tubers to develop a shallow red-brown corky dry rot, often followed by bacterial soft rot. Ensure skin set on tubers before harvest, and cool tubers as quickly as possible to 50 F while maintaining good air circulation. Monitor storage potatoes for infection. While there are many fungicides available for foliar applications, a few are targeted towards the tubers.

- Forum + protectant fungicide (*dimethomorph*; Group 40) – Rate: 4-6 oz/A – May be applied after vine-kill at a high rate for suppression of tuber blight.
- Phostrol or OLP (*phosphorous acid*; Group 33) – Rate: 0.1 gal in 0.5 gal water – Ensure complete, even coverage. Only controls further spread in storage, will not cure tubers already infected. Not recommended for fresh market tubers.

Silver Scurf

Fungus that infects the skin of potatoes, causing small, pale, brown spots. Severe browning of surface layers of tubers may occur, as well as sloughing-off of out layers. Harvest tubers as soon as they are mature, avoid harvesting green. Disinfect storages to kill any remaining spores from previous year. Keep storage temperatures as low as possible, and monitor storages to eliminate sitting moisture.

- Stadium (*azoxystrobin* + *fludioxonil* + *difenoconazol*; Group 11 + 12 + 3) – Rate: 1 fl oz/2000lbs – Post-harvest spray (not for use on seed pieces). Tubers should be tumbling during treatment to ensure proper coverage.
- Bio-Save 10LP (*Pseudomonas syringae*; Group NC) – Rate: 500 g/30 gal – Apply to tubers on conveyor belt or rollers by dip or spray prior to storage. Agitate mixture to ensure proper suspension. Uniform coverage is necessary. Quantity will treat 3000 cwt.

Late Blight Risk

John Gibbons, CCE Cornell Vegetable Program

This past week has been very favorable for late blight development. All stations will have accumulated 30 blight units (BU) needed to trigger a spray for late blight (LB) through the forecasted period thru 9/20. If the weather station closest to you has not yet reached 30 blight units (BU) and the forecast indicates that it will in the next 2-3 days, a spray is still recommended. Note that this 30 BU threshold is for fully susceptible varieties, and assumes the use of fungicides such as chlorothalonil. Warning! Forecast BUs can change day by day, just like the weather! The chart assumes that chlorothalonil at the high rate was applied on 9/11. Information for other weather stations can be found at the following address: http://newa.cornell.edu/index.php?page=potato-diseases

Late blight was found in Niagara county NY this past week. **Late blight has now been found in the following counties in NY: Allegany, Cattaraugus, Steuben, Genesee, Orleans, and Yates and Niagara County**. All have been the US-23 genotype. Niagara county sample determination is still in progress. Other states where late blight has been identified include Florida, North Carolina, Pennsylvania, Wisconsin, Tennessee, and Washington. In all these states US-23 has been the genotype. In the final stretch it is important to maintain protection of the vines, tomato or potato, until all green tissue is gone.

Late Blight Risk Chart, 9/17/19

Location[1]	Blight Units[1] 9/11-9/17	Blight Units[2] 9/18-9/20
Albion	19	17
Arkport	32	10
Baldwinsville	29	15
Bergen	26	13
Buffalo	34	12
Burt	NA	NA
Ceres	40	14
Elba	23	15
Fairville	18	15
Farmington	33	15
Fulton	33	16
Geneva	23	15
Hammondsport	22	14
Kendall	18	19
Knowlesville	23	18
Lyndonville	36	14
Medina	38	13
Niagara Falls	47	10
Penn Yan	46	15
Rochester	37	14
Sodus	31	17
Versailles	40	12
Wellsville	49	11
Williamson	18	18

[1] Past week Simcast Blight Units (BU)
[2] Three day predicted Simcast Blight Units (BUs)

Late Season Insect Pressure in Dry Beans

Margie Lund, CCE Cornell Vegetable Program

With the growing season winding down, it is easy to think we are past the threat of insect pests affecting dry bean fields. However, in the past couple of weeks, I have witnessed heavy pressure from Mexican bean beetles (MBB) in multiple fields in the region. MBB adults (Fig. 1) are a copper-brown beetle with black spots, and are closely related to and resemble other lady beetle species. However, unlike other lady beetles that are predatory, MBBs feed on dry bean, as well as snap bean and soybean, foliage. Adults lay eggs on bean plants, and emerged larvae (Fig. 2) will feed on those plants. Adults and larvae will feed on bean leaves, leaving behind a lace-like skeletonized leaf, and when present in high numbers, MBBs may also cause damage to bean pods (Fig. 3). Bean plants can generally handle up to 20% defoliation by MBBs before yield is threatened and treatment should be considered.

In New York State, MBBs will have 2-3 generations a year, and overwinter in fields and margins as adults. In the spring, over-wintered adults will emerge and return to near-by bean fields to lay eggs. In order to reduce population numbers in the spring, bean fields should be rotated as far away as possible from field locations of the previous year, especially if any fields had particularly heavy infestations. Fields should also be plowed under in the fall to help destroy overwintering beetles present in the field. If infestations are heavy (seeing >20% defoliation from beetles), insecticides should be considered to decrease population numbers. A parasitoid wasp, *Pediobius foveolatus*, can be used for control of MBB larvae, and can be a useful tool for controlling the population in the spring once eggs have hatched, especially in organic dry bean systems. It is important to note that this wasp only parasitizes beetle larvae, so it shouldn't be used if there are primarily adults present in fields. Early-planted trap crops used in the spring can also be used to attract beetles away from bean fields. Parasitoids can be introduced to the trap crops, or insecticides can be used to kill beetles. If you are experiencing heavy pressure from MBBs in your fields, there are many foliar insecticide options for controlling the pest, even late in the season.

*Reference chart for **foliar insecticides available for control of Mexican bean beetle in dry beans**. All details listed are for use in dry beans; please consult the label for REI, PHI, and rates for use in snap or succulent beans. Each mode of action (FRAC) group are shown in a different color. When rotating insecticides pick an insecticide with a different color (FRAC) grouping.*

Name*	FRAC group	REI hrs	PHI days	Rate/A	Comments
Sevin XLR Plus	1A	12	21	0.5-1 qt	
***Lannate LV**	1A	48	14	0.75-3 pt	
***Orthene 97 or OLP**	1B	24	14	0.5-1 lb	
***Dimethoate 400**	1B	48	0	0.5-1 pt	Beans may be harvested mechanically on same day as application
***Baythroid XL**	3A	12	7	2.4-3.2 fl oz	
***Warrior II w/ Zeon Technology or OLP**	3A	24	21	0.96-1.6 fl oz	
Assail 30SG	4A	12	7	2.5-5.3 oz	Avoid use if Cruiser 5FS (Group 4A) was used as a seed treatment
Aza-Direct	UN	4	0	1-2 pt	Control of larvae only
*Restricted-use pesticide					

Figure 1. Mexican bean beetle adults. *Photo: M. Lund, CCE CVP*

Figure 2. Mexican bean beetle (MBB) larva. *Photo: M. Lund, CCE CVP*

Figure 3. Dry bean pod damage from MBBs. *Photo: M. Lund, CCE CVP*

Figure 4. If gone unnoticed or left uncontrolled, MBBs can cause nearly complete defoliation of rows or fields as seen in the row on the left. *Photo: M. Lund, CCE CVP*

Monitoring Susceptibility of Onion Thrips to Radiant SC

Erica Moretti and Brian Nault, Department of Entomology, Cornell AgriTech; ed. C. Hoepting, CCE CVP

Are Onion Thrips Developing Resistance to the "Big Gun"?
When onion thrips migrate into an onion field from nearby onion fields that have matured or have recently been pulled or harvested, these influxes can cause thrips populations to sky-rocket to very high levels, which can cause excessive leaf dieback, vector Iris yellow spot virus and ultimately take a big bite out of bulb size and yield (Fig. 1). Radiant is the heaviest-hitting insecticide available to New York onion growers, and is the only product that stands a chance of reducing thrips populations greater than 5.0 per leaf (standard spray threshold is 1.0 thrips per leaf).

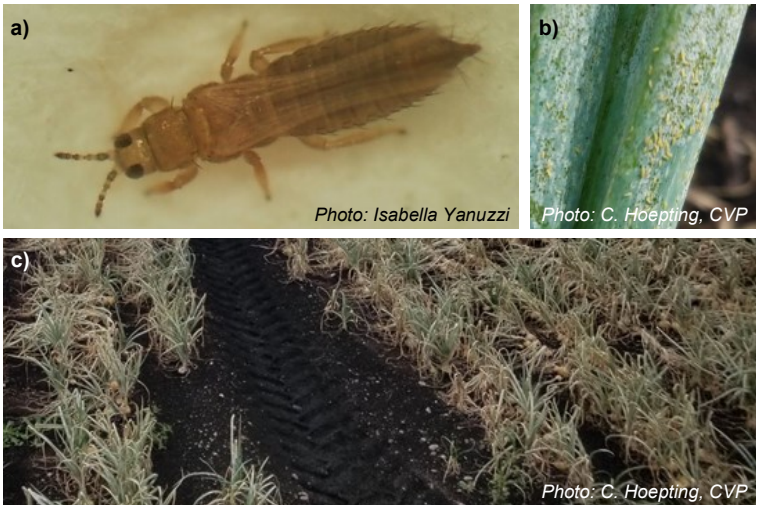


Figure 1. a) Onion thrips (*Thrips tabaci*) adult. High numbers of thrips feeding all along onion leaves **(b)** can quickly turn onion plants from green to white **(c)**, which ultimately reduces bulb size.

As the end of the onion-growing season approaches, battling the last waves of onion thrips in the remaining onion fields before harvest has been a challenge, especially in Elba muck where thrips pressure is typically high. **Recently, there have been cases where high populations of onion thrips have not been effectively controlled using high rates (8-10 fl oz) of Radiant.** Could it be because the thrips populations are so high that no insecticide would be effective? Or, could it be because the onion thrips have developed resistance to it? It is especially important to know whether thrips are developing resistance to an insecticide, so that an ineffective product is not recommended in the future.

2019 onion thrips populations from Elba tested for insecticide resistance to Radiant
We conducted a feeding bioassay in the laboratory to determine whether two seemingly uncontrollable thrips populations from Elba were susceptible to Radiant. Results were compared to baseline data that we generated during the last two years (2017 & 2018).

Onion thrips notorious for developing resistance to insecticides.
Onion thrips reproduce asexually (females do not need to mate with males), produce lots of offspring, and have multiple short and overlapping generations every growing season. This combination of traits puts them at high risk for developing resistance to insecticides. For example, overuse of the pyrethroid insecticide Warrior II (lambda-cyhalothrin) resulted in the development of resistance in the early 2000s, less than 10 years after Warrior was registered for use. Thrips biology and history of developing resistance to insecticides puts them at risk for developing resistance to Radiant. Determining if a population is, in fact, resistant, requires sampling and testing populations in the laboratory and ideally comparing their susceptibility to known susceptible and resistant populations.

Insecticide resistance bioassay. In order to establish a sense of thrips susceptibility to Radiant in Upstate NY onion fields, we evaluated onion thrips populations from four counties in 2017 and 2018. We modified an existing thrips feeding bioassay in which onion thrips adults are placed in small vials that contained different concentrations of Radiant SC (Fig. 2). After 48 hours, the numbers of live and dead thrips are recorded, and the lethal concentration of insecticide needed to kill 50% of a population (LC_{50}) can be determined for each population (Table 1). We estimated that a population resistant to Radiant would have an LC_{50} greater than 177-295 ppm (estimated for field rate 6-20 fl oz/acre). The thrips populations we sampled in 2017 and 2018 had LC_{50}s that ranged from only 2.07-5.08 ppm, indicating that they were highly susceptible to Radiant.

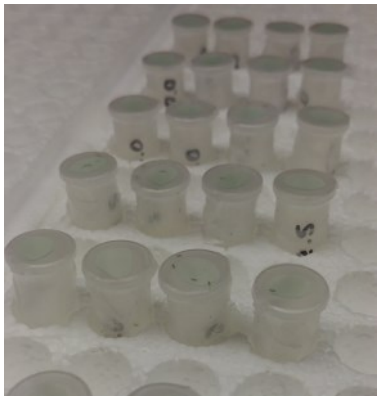


Figure 2. Small 1.5 ml tubes containing thrips for feeding bioassay. A stretched pouch of parafilm containing a small amount of Radiant and sugar water serves as the food source for the thrips. Mortality was evaluated after 48 hours.
Photo: Erica Moretti, Cornell

In 2019, both seemingly uncontrollable thrips populations came from direct seeded onion fields that were relatively centrally located within the Elba muck. The first field, OR2, was positioned between earlier maturing transplanted onions located to the north, south and east, and direct seeded onions to the west. This field received three applications of Radiant including a border spray at the south end to control an influx of thrips from lodging transplants at the beginning of August, followed by two applications of Radiant 10-days apart. The second field, OR1, was surrounded by other direct seeded onions to the east and west and received a total of two applications of Radiant applied during late August and early September in consecutive weeks.

continued on next page

Thrips bioassays were conducted from this field in 2017 and 2018.

2019 Elba bioassay results. The results of the 2019 bioassays indicated that **neither of these thrips populations were resistant to Radiant SC.** With LC_{50}s of only 2.8 ppm (OR2) and 3.4 ppm (OR1), these populations had similar levels of susceptibility to Radiant as those tested in 2017 and 2018 (Table 1). Phew!

Therefore, lack of thrips control was most likely caused by Radiant not being able to keep up with the continuous inundation of thrips coming out of neighboring onion fields being harvested, as well as from other sources such as hay or wheat fields.

Table 1. Survey of susceptibility of *Thrips tabaci* adults to Radiant SC (spinetoram) from populations collected in commercial onion fields in New York 2017-2019.

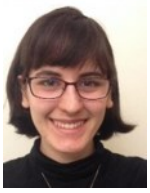
Note that a population resistant to Radiant would have an LC_{50} greater than 177-295 ppm (estimated for field rate 6-20 fl oz/acre).

Population	*N*[a]	LC_{50} (ppm)	95% CL[b]
2017			
OR1	177	2.69	2.15-3.37
LN	109	2.07	2.05-2.08
JO	294	3.33	3.02-3.67
2018			
OR1	181	4.38	3.52-5.44
DA	228	2.89	2.31-3.62
LN	304	4.46	4.28-4.65
PO	255	5.08	4.41-5.85
2019			
OR1	556	3.42	3.22-3.63
OR2	386	2.80	2.70-2.90

[a] Total number of thrips evaluated in bioassay used to calculate LC_{50}
[b] Confidence limit of each LC_{50}

Radiant is as good today as it was when we first got it 10 years ago, which is indisputably due to careful and thoughtful use of this product and all insecticides via resistance management by onion growers. There are several steps that can be taken to continue this success using Insecticide Resistance Management (IRM):

- Use an Integrated Pest Management (IPM) approach, diversifying management tactics
- Follow action thresholds, scouting fields to assess pest levels and only spraying when necessary
- Rotate modes of action (classes of insecticides) so that thrips are not exposed to the same chemistry repeatedly throughout the growing season
  - For spray sequence recommendations see Christy Hoepting and Brian Nault's 2019 Cornell Guidelines for Onion Thrips Management in Onion (VegEdge Vol. 15 Issue 14) and on the CVP website (https://cvp.cce.cornell.edu/submission.php?id=587&crumb=crops|crops|onions|crop*20)
  - For more information about IRM, see recommendations outlined by the Insecticide Resistance Action Committee (IRAC, irac-online.org)



Erica Moretti is a Masters student with Brian Nault, Department of Entomology, Cornell. Although her research thesis is on onion maggot, she has also worked on onion thrips resistance to spinetoram (Radiant) in onion for the past 3 years. In addition to honing research skills, she has also focused her efforts on extension and outreach to become acquainted with the challenges faced by growers in the region.

NY Sweet Corn Trap Network Report, 9/17/19

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

WNY Pheromone Trap Catches, 9/17/19

Location	ECB-E	ECB-Z	CEW	FAW	WBC
Batavia (Genesee)	0	0	12	0	0
Bellona (Yates)	0	0	9	187	0
Carlton (Orleans)	0	0	0	83	3
Eden (Erie)	NA	NA	NA	NA	NA
Farmington (Ontario)	0	0	3	2	0
Geneva (Ontario)	NA	NA	NA	NA	NA
Kennedy (Chautauqua)	NA	NA	NA	NA	NA
LeRoy (Genesee)	0	0	61	70	1
Lyndonville (Orleans)	NA	NA	NA	NA	NA
Penn Yan (Yates)	0	0	22	9	NA
Portville (Cattaraugus)	0	0	2	9	1
Ransomville (Niagara)	0	0	15	2	0
Seneca Castle (Ontario)	0	0	1	15	0
Williamson (Wayne)	NA	NA	NA	NA	NA

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

Statewide, twenty-one sites reporting this week. No European corn borer (ECB)-E was caught and only one site caught ECB-Z. Eighteen sites reported corn earworm (CEW), with seventeen high enough to be on a 3, 4, 5, or 6 day spray schedule (see table at bottom of post). CEW leveled off this week after 5 straight weeks of increased trap catches. Fall armyworm (FAW) was caught at nineteen sites and average trap catch increased a little after last weeks decline. Western bean cutworm (WBC) was caught at only five sites this week.

Average corn earworm catch and recommended spray interval

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.

DRY BEANS

Western bean cutworm have not be caught in traps in dry bean fields in the past two weeks. Mexican bean beetle pressure has increased in many dry bean fields, so thresholds should be monitored and an insecticide treatment considered when 20% defoliation has occurred – see Late Season Insect Pressure in Dry Beans, page 5. Dry bean fields should also be monitored for the presence of Palmer amaranth, a stubborn weed found in soybean and dry beans – see Identifying Palmer Amaranth and Waterhemp, page 10. If you believe you may have Palmer amaranth in your field, please contact a local specialist to take a sample. – *ML*

ONION

Harvesting is in various stages with some farms almost finished, some barely begun, some halfway and everything in between. With the late plantings, there is still A LOT OF GREEN for it being mid-September. The above average temperatures into the 80s and no rain forecast until next Sunday should help move the crop and harvest along. The most questionable fields as to how to proceed are those that have barely started lodging – see Wrong vs. Wrong on the next page. Yield and quality are reported to be very good so far. **Are thrips developing resistance to Radiant? – see article, page 6.**

POTATO

Potato harvest is underway in many fields. Proper handling and curing techniques should be used for potatoes going into storage in order to avoid injury to tubers which can lead to diseases down the road. See Post-Harvest Pesticide Applications for Potatoes in Storage, page 3. – *ML*

PROCESSING VEGETABLES

Save the date: December 17th Processing Vegetable Crops Advisory, Batavia. Details to follow.

Harvest continues for all crops with carrot harvest now underway. Keeping the tops of carrots and beets healthy through harvest is important for top-pulling machines. Carrot fields have been looking really good this year. Carrot leaf diseases were discussed in the September 4 issue of VegEdge. Seneca Foods reports that table beet harvest in NY is about half-way done with generally good yields and little root decay. Cercospora leaf spot in beets is becoming more prevalent in some fields. Lima bean and snap bean harvest continue with good yields and quality. Some wind scars are being reported on snap bean pods. So far, there have been limited problems with white mold, but the cool nights with heavy morning dews favor this disease and there are still several weeks of harvest to go. Spinach is growing well, with harvest targeted to start in October. Looking back on the year so far, wet and cool weather early in the season hampered planting of all crops creating gaps in harvest. There were pea acres that did not get planted and shallow rooted crops did not hold up well to hotter, drier conditions later on. Root rot in peas was also prevalent and slugs were a significant problem. Downy mildew was observed in some pea fields, but not a widespread problem. This will be the last seasonal update as VegEdge transitions back to monthly for the rest of the year. – *JK*

WRONG vs WRONG

By Christy Hoepting, CCE Cornell Vegetable Program

This is a discussion that I had on Tuesday with a couple of growers regarding a late-planted field of direct seeded Red Wing that was "trying" to lodge (e.g. ~5%) and had not had sprout inhibitor yet. It is still very green with about 20% leaf dieback/tipburn and SLB settling in pretty good (a noticeable increase in disease since last week).

Me: **"It just seems *wrong* to get this far and not protect the crop now** [with fungicide and/or insecticide]**."**

Growers: **"It just seems *wrong* to get this far and try to keep them green."** (As some of the new powerful fungicides can do.)

Here was my recommendation.
First, here is what I know to be true:

1) At best, only an excellent fungicide spray (e.g. Luna Tranquility 16 fl oz) can "hold" leaf dieback from progressing to "excessive" when it is applied when leaf dieback is 30% or less.
2) Uncontrolled SLB or thrips at 30% leaf dieback can progress to plants dying standing up in 1 week WHEN PRESSURE IS HIGH (as it tends to be in September).
3) In my fungicide trials, the rate at which onions die back after lodging translates into differences in yield – the healthier the foliage and the longer they stay green, the bigger the bulbs PROVIDED the crop is not pulled and the bulbs are allowed to take in all that foliage.
4) The weather is usually not conducive to quick dry down in late September and October, and chances of topping when neck tissue is still green (which increases risk of bulb rot) increases.

So, I ask, "Has this crop made enough size?"
If yes, then priority should be on drying it down. Get sprout inhibitor on, pull it and give it time to dry down so that necks are not topped green during harvest.

If no, then give it one more fungicide and/or insecticide spray to give crop best chance of drying down naturally (and not to die standing up).

In this case, the grower was going to roll the crop after last fungicide spray to encourage maturation (and to knock down plants that "don't know it's over" and are still putting on new leaves – these plants will NEVER lodge, so that they can start drying down). If harvest runs so late that necks are a bit green when topped, they will cure them artificially.

How you proceed depends on whether you want to risk increased bulb size at the expense of topping green necks, or whether you want to avoid harvesting green necks at the expense of bigger bulb size.

Christy Hoepting and CVP Technicians, Emma van der Heide and Sarah vande Brake, aka "red buck scientists" completed days of fungicide evaluations for Stemphylium and Botrytis leaf blights over the past 3 weeks. Over 3000 individual plants were examined/rated/judged in four trials. The results will be very interesting – stay tuned for the results and new fungicide recommendations. *Photo: A. Harrington*

50 years and 3 generations of Oswego Onion Extension Educators. Left: Dale Young, CCE Oswego from 1970 to 1996. Right: Jan van der Heide, CCE Oswego 1996 to 2005; Bejo Seeds 2005 to present. Middle: Christy Hoepting, CCE CVP Onion Specialist 2001 to present, Oswego joined CVP in 2017. All three remain integrated in Oswego onion industry. *Photo: Sarah vande Brake*

Identifying Palmer Amaranth and Waterhemp

Lynn Sosnoskie, Assistant Professor of Weed Ecology and Management for Specialty Crop Systems, Cornell University

Waterhemp (*Amranthus tuberculatus*) and Palmer amaranth (*Amaranthus palmeri*) are aggressive amaranths that can grow at rates of inches per day (to heights of 8 feet or more) under optimal conditions. Consequently, both species are capable of significantly reducing crop yields via competition for water, nutrients and light, and can indirectly impact harvest by physically interfering with the movement of men and machinery through fields. Waterhemp amd Palmer amaranth are dioecious, meaning that male and female flowers are produced on separate plants; this can have evolutionary consequences as herbicide resistance traits (such as resistance to glyphosate and the ALS-inhibiting herbicides) can be transferred via wind-mediated pollen flow. Both amaranths can produce prodigious amounts of seed (up to 1 million per female plant) which can be transported across long distances via vehicles and equipment. The best strategy to prevent significant populations of waterhemp and Palmer amaranth from becoming established throughout the state is to eliminate infestations in a timely manner. This requires successfully identifying the species and differentiating them from other amaranths already occurring in New York.

Waterhemp leaves are long, narrow, elliptical and dark green in color

Petioles of waterhemp (left) are shorter than leaf blades; Palmer amaranth (right) petioles are longer

Palmer amaranth leaves are diamond-shaped and give the plant the appearance of a pointsettia

Male Palmer amaranth flowers (left) do not possess the same sharp bracts the females (right) do

Photos: L. Sosnoski, Cornell

Waterhemp is an upright/erect pigweed species (growing to heights of 5-7'). The stems are smooth and range from green to red in color. Although leaf shape can be variable, most leaves (especially older ones) are long and narrow; leaves are typically dark green and shiny. Waterhemp produces male and female flowers on separate plants; flowers are produced, primarily on terminal inflorescences that are long (up to 1' or more in length) and minimally branched. Palmer amaranth is also an erect pigweed species (growing to heights >6-8'). Like waterhemp, the stems are hairless and range from green to red in color. Leaf shape can be variable, but most leaves are egg-, diamond-, or lance-shaped; leaves may sometimes exhibit a white or purple chevron-shaped watermark on them. Leaf petioles (especially on older leaves) are as long or longer than the leaf blades. Palmer amaranth also produces male and female flowers on separate plants. Flowers are primarily produced on long (up to 2-3' or more in length) and minimally branched, terminal flower spikes or on spikes that arise from upper leaf axils. Female Palmer amaranth flowers can be distinguished from waterhemp by the presence of very sharp bracts. Both species can produce up to a million seed per female plant and should never be allowed to achieve reproductive maturity.

Characteristics that can be used to differentiate among some pigweed species

Species	Leaf blade	Petiole length	Stem	Reproduction	Primary location of flowers
Waterhemp	Long, narrow, elliptical and dark green	Shorter than leaf blade	Smooth, green to red in color	Male and female flowers on separate plants	Terminal panicle
Palmer amaranth	Diamond-shaped	Longer than leaf blade	Smooth, green to red in color	Male and female flowers on separate plants	Terminal panicle SHARP bracts below all female flowers
Redroot pigweed	Egg-shaped (widest near base) to diamond-shaped, hair on underside of veins	Shorter than leaf blade	Hairy	Male and female flowers on same plant	Terminal panicle
Powell's amaranth	Diamond-shaped	Shorter than leaf blade	Smooth to sparsely hairy	Male and female flowers on same plant	Terminal panicle
Smooth pigweed	Egg-shaped (widest near base) to diamond-shaped	Shorter than leaf blade	Smooth to densely hairy (mainly upper stems)	Male and female flowers on same plant	Terminal panicle
Prostrate pigweed	Spoon-shaped, dark green and glossy	Shorter than leaf blade	Succulent and red in color	Male and female flowers on same plant	Leaf axils

More information about weed identification can found at https://nysipm.cornell.edu/agriculture/vegetables/weed-identification/

Weather Charts

John Gibbons, CCE Cornell Vegetable Program

Weekly Weather Summary: 9/10 - 9/16/19

Location**	Rainfall (inch)		Temp (°F)	
	Week	Month September	Max	Min
Albion	0.97	2.11	85	48
Arkport	1.99	2.50	86	48
Bergen	0.84	2.42	83	46
Brocton	1.25	2.78	82	53
Buffalo*	2.66	4.51	81	53
Burt	2.00	3.12	82	51
Ceres	0.76	1.73	83	50
Elba	0.91	2.24	81	48
Fairville	0.83	1.81	81	44
Farmington	0.96	2.39	84	45
Fulton*	0.45	1.95	80	43
Geneva	0.45	1.38	83	48
Hammondsport	NA	NA	84	48
Hanover	1.25	4.10	83	52
Lodi	0.46	1.58	84	50
Niagara Falls*	1.87	3.47	81	49
Penn Yan*	0.16	1.09	85	48
Rochester*	0.91	2.03	83	50
Sodus	0.92	1.77	82	46
South Bristol	0.68	1.49	82	47
Varick	0.82	2.32	85	51
Versailles	1.23	3.25	83	50
Williamson	1.04	2.41	83	45

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 - September 16, 2019

Location	2019	2018	2017
Albion	2252	2712	2242
Arkport	2008	2600	2038
Bergen	2162	2581	2108
Brocton	2229	NA	NA
Buffalo*	2315	2796	2277
Burt	2087	2526	2071
Ceres	2095	2385	1958
Elba	2063	2551	2140
Fairville	2071	2517	NA
Farmington	2099	2558	2080
Fulton*	2091	2601	2124
Geneva	2218	2615	2186
Hammondsport	2098	2497	2077
Hanover	2214	2647	NA
Lodi	2259	2664	2278
Niagara Falls*	2201	2819	2493
Penn Yan*	2317	2709	2325
Rochester*	2395	2876	2334
Sodus	2027	2494	NA
South Bristol	2075	2499	2059
Varick	2337	2707	2317
Versailles	2172	2624	2169
Williamson	2018	2465	2123

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

Cornell Cooperative Extension
Cornell Vegetable Program

480 North Main Street
Canandaigua, NY 14424

VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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

VEGETABLE SPECIALISTS

Elizabeth Buck | 585-406-3419 cell | emb273@cornell.edu
fresh market vegetables, weed management, and soil health

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, broccoli, and pesticide management

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

Margie Lund | 607-377-9109 cell | mel296@cornell.edu
potatoes, dry beans, and post-harvest handling and storage

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

PRECISION AG SPECIALIST

Ali Nafchi | 585-313-6197 cell | anafchi@cornell.edu

PROGRAM ASSISTANTS

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

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

Sarah Vande Brake | sv483@cornell.edu

Emma van der Heide | ev247@cornell.edu

Caitlin Vore | cv275@cornell.edu

ADMINISTRATION

Peter Landre | ptl2@cornell.edu

Steve Reiners | sr43@cornell.edu

Cornell Cooperative Extension
Cornell Vegetable Program

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