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Cooler, wet

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bacterial Speck

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Downy mildew is to onions as late blight is to potatoes. It's an aggressive leaf defoliator and

or onions dying standing up.



Onion thrips feeding in cabbage results in unsightly brown blistering and scarring that



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Try to get a cover crop established when the weather and soil moisture permit. Learn about some late

summer cover crop options.

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YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Volume 11



Cornell University Cooperative Extension Cornell Vegetable Program

Bacterial Speck of Tomato

Judson Reid, CCE Cornell Vegetable Program

With the news of Late Blight spreading in New York, commercial growers have made focused management decisions to prevent yield loss. However, a bacterial disease; Speck, has emerged from the barrage of Late Blight sprays and is causing heavy losses. The disease is wide spread in western New York currently, with the cooler, wet summer influencing spread.

There are three major bacterial diseases of tomato in NYS: Speck, Spot and Canker. All three can affect fruit quality. With Speck and Spot, the level of infection in the canopy can be misleading as to the level of infection on fruit. The level of fruit infection is higher than other foliar diseases.



Bacterial speck lesions on tomato fruit. Photo: Judson Reid, Cornell Vegetable Program



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

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Cooperative Extension Cornell Vegetable Program

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The next issue of VegEdge will be produced August 12, 2015.

Tomato Fruitworm

Judson Reid, CCE Cornell Vegetable Program

Tomato Fruitworm was discovered on tomatoes this week. This pest is also known as Corn Earworm. It is an occasional pest of tomatoes, but renders affected fruit unmarketable. This is of much more concern in sweet corn, thus the CVP maintains a trap network to monitor flights. Corn Earworm catches have been up in our traps recently and it follows that some moths will find their way into tomatoes. This pest does not overwinter in New York, so watching the corn trap counts is important for tomato growers to see when they have arrived from the south. Bt sprays can be effective on smaller stages of the worm and have a 0 day PHI. Conventional materials with 0 day PHI include Baythroid XL and Leverage. However, infestations of this pest are often very localized in tomatoes. Spot sprays are an option as damage is often restricted to several row feet. O



Tomato Fruitworm damage (above). Tomato Fruitworm, AKA Corn Earworm (below). Photos: Judson Reid, Cornell Vegetable Program



Speck appears to be the most common bacterial disease this summer with a minimum two-year rotation away from tomatoes and peppers recommended. It is clear that the disease will overwinter on used stakes. There is an ongoing debate as whether to dispose or disinfect stakes from affected fields.

Copper continues to be regarded as the most effect spray material. The fungicides mancozeb, Tanos, Gavel, and Ziram are labeled for control of bacterial disease when tank mixed with copper. This disease is very difficult to suppress, so control measures must be taken as soon as detected. Future articles will discuss prevention prior to transplant.



Bacterial speck of tomato. Photo: Judson Reid, Cornell Vegetable Program

Yellow Shoulder on Tomato

Steve Bogash, PSU Extension, and Michael Orzolek, Penn State University

Yellow shoulder and Blossom end rot (BER) are the two primary physiological challenges in tomato culture. Yellow shoulder is a physiological disorder of tomatoes that is characterized by discolored regions under the skin that show through and reduce the quality of the fruit. The disorder can range from very mild with some internal spotting to guite severe with large areas that are hardened and yellow to white. This wide variation in symptoms has spawned a number of names for the same primary disorder: yellow shoulder, yellow eye, green shoulder, yellow tag, gray wall, and internal white tissue. It is very important for growers to understand that yellow shoulder is not a delayed ripening, but an actual disorder of the affected tissue. Often, growers find that by focusing more closely on their nutritional program in seeking to prevent Yellow shoulders, they also reduce or eliminate BER.

The cells in the affected sectors of the fruit are generally smaller in size and have a more random arrangement than that of normal cells. Green chlorophyll in these regions fail to develop red pigment. This happens very early in fruit development, which makes early plant tissue analysis extremely important in prevention, as uniform color requires more K+ than the amount required to sustain yield.

The cause of the yellow shoulder disorder in tomato fruit has baffled scientists for the last 30 years. Many scientists believe there are several causal factors for yellow shoulder including: environment (specifically, high temperature >90°F), nutrition, genotype (cultivar) and virus. The interaction of these factors under field conditions is very difficult to evaluate. This disorder can be triggered by insufficient exchangeable K+, excess magnesium in relation to calcium, and pH above 6.7.

Management options to reduce yellow shoulder include increasing K+ to above 3% by dry matter before the fruit is larger than 1", adjusting the soil pH to 6.4-6.7 and increasing the Mg/Ca ratio to 1/6 or better (1/4 is ideal). Tissue analysis at the first flower initiation is extremely important in preventing yellow shoulder as once fruit is hanging and damaged it will not improve. Also, certain cultivars are less susceptible and others at higher risk, so cultivar selection is integral to a program to manage this color disorder. Certain processing varieties have been identified as less susceptible, but much research remains to be done on fresh market varieties in order to identify those that are more or less susceptible. Some growers have anecdotal reports of cultivars that are more or less susceptible, but minimal research has been done to conclusively identify those cultivars.

The practice of letting the fruit hang longer in order to "color up" does not work and has the potential to increase the danger from fruit rots. Increasing K+ through the drip lines once there is abundant fruit hanging is also unlikely to lessen symptoms as this disorder shows up very shortly after fruit set.

Quite a bit of work has been done by UC Davis and Ohio State on prevention of this disorder in processing varieties. They have developed the Hartz formula for anticipating the risk of yellow shoulder. This formula can be readily accessed online at <u>www.oardc.ohio-</u> <u>state.edu/tomato</u>. You will need recent soil and leaf analysis results in order to use the formula.

For most growers the best practices to prevent yellow shoulder will be to intensively tissue test tomatoes from first flower cluster for Ca, K+ and Mg levels. From this information, a grower could apply Potassium Nitrate, Sulfate of Potash, Potassium Carbonate, Calcium Nitrate, Calcium Chelate, and Magnesium Oxide to reduce the potential for this disorder.

Experience has proven that both fertigated and foliar applied nutrients are necessary to prevent Yellow shoulders. Many growers have been able to increase tomato plants uptake of potassium through adjusting the pH of their drip irrigation water. Keeping the irrigation solution pH at 6.2-6.5 will greatly improve tomato plants ability to move potassium from the soil to plant tissue. Most conventional growers use Sulfuric acid to reduce pH, while many organic growers use powdered Citric acid for this purpose.

Managing Downy Mildew of Onion: Control of Target Spot Diseases is Critical

Christy Hoepting, CCE Cornell Vegetable Program

Downy mildew is to onions as late blight is to potatoes. Generally, downy mildew (DM) is considered a sporadic disease of onion in Western New York. It is favored by cool temperatures (less than 72°F) and long periods of dew. Typically, it is not a concern until mid-August through September once the heat wave of summertime gives way to cool nights and heavy dews. However, ever since the DM epidemic of 2009, this disease seems to more commonly first appear in July. Downy mildew is to onions as late blight is to potatoes; it can be a very aggressive leaf defoliator and result in immature plant maturity or "onions dying standing up" (Fig. 1), which results in reduced bulb size and storage quality. When weather conditions are favorable, it is very challenging to manage a DM outbreak.



Figure 1. Downy mildew epidemic of 2009: Downy mildew of onion is like late blight of potato, a very aggressive defoliator, which results in premature plant mortality (onions dying standing up) leading to reduced bulb size and storage quality. *Photo: Christy Hoepting, Cornell Vegetable Program*



Figure 2. Infection site of downy mildew in onion can quickly become invaded by pathogens of Stemphylium leaf blight (black) and Purple blotch (purple), which quickly blight the leaves. *Photo: Christy Hoepting, Cornell Vegetable Program*

Fungicides put to a tough test for downy mildew control.

A severe outbreak of DM occurred in the commercial onion field where the 2014 CVP onion fungicide trial was conducted (yellow direct seeded onions, c.v. Safrane, muck soil). Plants were first infected with DM, the necrotic spots of which were quickly invaded by target spot diseases, Stemphylium leaf blight (SLB) and Purple blotch (PB) which quickly blighted the leaves (Fig. 2). The first fungicide applications were made on July 24 when foliage was healthy just after the first DM infection sites were observed. By August 13, the average amount of green foliage in the trial was 54%, which dropped to 12% just 2 weeks later. All of the plants in the trial were infected with DM and SLB/PB and a treatment was considered effective if the onion plants could mature normally (i.e. lodge) before the diseases killed them (Fig. 3). In the untreated plots, an average of 92% of the onions had died standing up (Fig. 4a).



Figure 3. Under severe downy mildew and Stemphylium leaf blight pressure, the goal of this 2014 CVP fungicide trial was to manage this disease complex so that the onions would mature and lodge properly instead of dying standing up. The top two performing treatments are highlighted in yellow. *Photo: Christy Hoepting, Cornell Vegetable Program*

 Table 1. Cornell program for managing downy mildew in onion, treatment in 2014 fungicide trial.

	Fungicides applied	Target disease ¹
Week No. 1	Quadris Top 14 fl oz	SLB, DM
(preventative)	+ mancozeb	DM
Week No. 2 & 3 (DM detected)	Ridomil Gold Bravo 2.5 pt + mancozeb 3 lb + Scala 18 fl oz	DM DM SLB
Week No. 4	Pristine 18.5 oz	SLB, DM
(must rotate away from Ridomil	+ mancozeb	DM
Week No. 5	Ridomil Gold Bravo 2.5	DM
(last allowable app of Ridomil	pt + mancozeb 3 lb	DM
Gold)	+ Scala 18 fl oz	SLB

¹SLB: Stemphylium leaf blight; DM: downy mildew

Fungicides for SLB control critical to managing DM outbreak.

The highest total plant health score based on 5 evaluation criteria including greenness of foliage and % immature plant mortality per plot, and number of green leaves and % leaf dieback per plant, was achieved with the "Cornell program", which was 2.8-fold higher than the untreated check (Fig. 3), and only 7% of the plants died standing up (Fig. 4a). The Cornell program included mancozeb for DM protection in every spray, maximum allowable usage of Ridomil Gold Bravo for curative control of DM and a fungicide with good activity against SLB (Quadris Top, Scala and Pristine) in every spray (Table 1). Luna Tranquility + mancozeb performed statistically as good as the Cornell Program with only 3% of the plants died standing up (Fig. 4a). Inspire Super + mancozeb and Scala + mancozeb placed third and fourth, respectively, and were not statistically different from Luna Tranquility + mancozeb. In fifth place was Fontelis + mancozeb. It is interesting how well these treatments performed, because with exception of mancozeb, the actives in these fungicides are not known to have any activity on DM. All of these treatments scored significantly higher than mancozeb alone (Fig. 3). These results suggest that managing SLB is critically important when managing a DM outbreak. Note that Luna Tranquility and Fontelis are not labeled in onions in New York.

Despite these fungicides having known activity against DM, Reason, Dithane (a.i. mancozeb), Revus and Phostrol when used alone did not score significantly higher than the untreated for plant health (Fig. 4b). These treatments along with Pristine and Tanos + mancozeb also had 75% or more immature mortality, which was not significantly different than the untreated (Fig. 4a). We know from previous trials that mancozeb does not have any activity against SLB, and we assume that aside from Pristine, none of these other products do either. Again, demonstrating how critical management of SLB is when managing a DM outbreak.



Figure 4. Immature plant mortality (a) and total plant health score (perfect score: 500) (b) of selected fungicides for managing downy mildew and Stemphlium leaf blight complex in onion, 2014.







A cold front has triggered more rain and damp conditions. Night temperatures are due to drop back again into the mid 50'sF. Heavy dews will keep leaves wet for long periods of time. Bacterial and fungal diseases will remain the big problem for management. The cool temperatures will also slow plant growth and ripening. Greens will do well for sure.

Flea beetles remain a problem in greas. Tarnish plant bugs are showing up in greens (lettuce), peppers, tomatoes, and aphids hitting lettuce and winter squash.

Leaf miners once again starting to show up in chard and beet greens. Hit this pest quickly to keep the leaves from getting ruined.

COLE CROPS

Following last week's heat wave, hot weather of which is favorable for tiny insects, especially onion thrips, thought it would be useful to mention control of onion thrips – see article, pg 8.

DRY BEANS

Western bean cutworm (WBC) moths reached peak emergence in the past week. Of the 10 fields with WBC moth traps in the dry bean production area 6 have passed the 100 moth/trap threshold of concern: Riga (181), Lima (110), Stafford (129), Avoca (108) Attica (300) and Wyoming (300+). Two WBC egg masses were found in corn near the Lima field last week, and one near the Riga field this week. In a sweet corn field in Pavilion 282 moths were caught. Traps in Caledonia, Sparta, Geneva and Wayland are below the threshold. Moth catches can vary quite a bit with trap site, however, and WBC moths are strong fliers, so growers within a wide area of a high trap catch should be concerned. WBC is easier to find in corn before beans have pods. Check upper leaves at this point. Larvae will only be found on non-WBC resistant corn, however, though eggs are laid on all corn. Small larvae may stay inside bean pods, but medium to large larvae hide in the soil during the day. Scout bean flowers, pin pods and pods for damage/feeding holes. If any WBC damage is observed one spray of a pyrethroid insecticide such as Warrior, Asana, Baythroid, etc. is recommended, applied a week after peak moth catch, based on research in Michigan. One trial resulted in WBC larval control up to 14 days after a Warrior application. Organic growers using Pyganic may need more than one spray. Scout for potato leafhoppers, especially if you did not plant Cruiser insecticide treated seed.

An early field of cranberry beans is showing significant <u>bacterial disease</u> on the leaves and the pods in spite of recent dry weather (see photo). Leaves have small dark spots with wide light green to yellow rings around

them. Pods have water-soaked spots. There are a few different bacterial diseases of beans but the recommendation is the same, repeated sprays of copper fungicide, with good coverage, to slow the spread. Don't work in the beans when they are wet to avoid spreading the disease. It will be important to defoliate a field with either bacterial disease or <u>white mold</u> as soon as the seed is physiologically mature to speed drying of the pods.

ONIONS

Last week's heat wave, lack of rainfall and harvest of wheat resulted in an increase in <u>onion thrips</u> pressure, particularly in the Elba muck land with all fields in our scouting program needing to be sprayed this week. Fields that are neighboring fields that are being harvested and those that are located in known thrips "hot spots" had especially dramatic increases in pressure this week. In Wayne County and Potter, onion thrips pressure is much lower where some fields have still only had a single application of Movento. If your next spray in sequence was supposed to be Agri-Mek (after Movento or first Agri-Mek) and your thrips counts are greater than 2.5 – 3.0 thrips per leaf, consider using Radiant instead. The reason being that Radiant is the only insecticide that can reliably reduce a thrips population of this magnitude. Once the population is 1.0 or lower, Agri-Mek, Lannate + Warrior or Exirel may be used, and you can return to Radiant again later. Depending on how high the thrips pressure is, it may take 1 or 2 applications of Radiant to achieve knockdown. Although, we have already had successes this season of a single emergency application of Radiant knocking back a thrips population of greater than 5.0 per leaf to less than 1.0 per leaf. For a decision tool to help guide strategic management of onion thrips, see <u>http://cvp.cce.cornell.edu/</u> submission.php?id=240. Also noticed an increase in incidence of Iris yellow spot virus this week, which is vectored by onion thrips.

Other breaking news this week is the **first detection of downy mildew (DM)** in **Wayne County muck lands.** Downy mildew has occurred at very low and non-aggressive levels in Elba and surrounding area for about 3 weeks already. However, new infection sites (Fig. 1) were detected in Elba this week too. In my experience, I have fought DM with a heavy fungicide program and barley got the onion crop to mature properly. On the other hand, I have seen DM dry up all on its own and not amount to any economic damage. How aggressive DM is very much depends on the weather. It has also been my experience that effective control of DM is much more likely achieved with a preventative program, because once it gets going it is virtually impossible to catch, let alone stop. Thus, it makes sense

continued on next page





Dry bean leaves and pods with bacterial disease spots. *Photo: Carol MacNeil, CVP*

continued - CROP insights

to run a preventative program, which includes mancozeb, phosphorous acid, Quadris/Quadris Top, Pristine or Merivon, the later four of which can also be used to manage target spot diseases. **Ridomil Gold products** with active ingredient mefenoxam, are typically recommended once DM is first detected as this fungicide has curative activity. So, when does it make economic sense to apply Ridomil? If the onions have already begun to lodge and have only a couple more weeks, if only a handful of DM lesions are detected, chances are such a field would mature and yield fine without Rido-



Figure 1. New downy mildew infection site. A single lesion on a single leaf, purplishgray sporulation on green leaf tissue with necrotic spot just starting to appear, no invasion of black and/or purple target spot diseases. *Photo: Christy Hoepting, CVP*

mil. I would be most concerned with the youngest onions that have 4 to 6 weeks left to go, especially if DM can be found at low levels throughout the field. Another option could be to double up on DM protectant fungicides (two is better than one), such as Quadris for target spot and DM + mancozeb for DM. Research results from 2014 onion fungicide trial revealed that managing DM was very much about managing a DM-target spot disease complex with effective control of target spot diseases being critical – *see article, pg 4*. Thus, running an effective target spot disease program with a DM protectant may be enough.

ΡΟΤΑΤΟ

More vine-killing is occurring or planned for the next week, and some early fields are being dug. Yield and quality vary widely depending on water damage. Potato plants have suffered during the past week from the heat and lack of rain. All stages of the <u>Colorado potato beetles (CPB)</u> can be found. If you need to spray an insecticide use a material from a different Chemical Class than you used on the seed, at planting, or as an earlier foliar spray. <u>Potato leafhoppers (PLH)</u> are increasing in the area. Scout your fields. To reduce <u>tuber blight</u> the use of Ranman (high rate) or Presidio, with a mixing partner, is recommended later in the season. Gavel, Zing!, or Forum plus a mixing partner, can contribute to reduced tuber blight. Use of Quadris Opti/Top or Cabrio Plus (alternate with an unrelated fungicide), or Revus Top in mid-season can help reduce <u>black dot</u> on tubers.

SWEET CORN

Bird damage has been severe in many location of several weeks now. I suspect it may get worse the later in the season it gets. In our initial bird repellent study, the repellent product Avian, a grape extract has shown some affect at reducing bird damage (sprayed on) in some (not all) research trial plots.

WNY Sweet Corn Trap Network Report, 8/4/15

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

Twenty-one sites reporting this week. Sixteen sites reporting European corn borer (ECB)-E. Seneca Castle had the high count again this week with 225 moths caught. ECB-Z was reported from eight sites. Corn earworm (CEW) was caught at twelve sites with eight sites high enough to require a 6, 5, or 4 day spray interval (see spray table at bottom of post). Nine sites reporting Fall armyworm (FAW) and twenty sites reporting Western bean cutworm (WBC).

Several sites reporting feeding damage by FAW in whorl stage corn. The larvae feeding in the whorl are protected from insecticide applications and mortality will not be as high as at tassel emergence, when larvae feeding in the emerging tassel are exposed to the spray. Larvae will leave the tassel as it opens up and no longer provides a moist, protected feeding environment, and move down the plant looking for protected places to feed. Insecticide applications need to be timed to kill larvae before they bore into a new feeding location where they will be again protected from sprays. In fields with very uneven development, two applications may be necessary, one when approximately 25-50% if the tassels have emerged, and again after 75-100% of the tassels have emerged, if the field is still over threshold. The threshold for ECB and FAW at tassel emergence is 15% infested plants. To learn how to scout sweet corn please see the video titled: How to Scout Fresh Market Sweet Corn (check out the IPM website for videos and further information http://sweetcorn.nysipm.cornell.edu/2015/08/04/ wny-sweet-corn-trap-network-report-8-4-15/) •

WNY Pheromone Trap Catches: August 4, 2015

Location	ECB-E	ECB-Z	CEW	FAW	wвс	DD to Date
Baldwinsville (Onondaga)	8	4	0	5	23	1565
Batavia (Genesee)	55	0	8	0	14	1217
Belfast	2	0	0	0	2	1415
Bellona (Yates)	1	2	0	6	33	DD
Eden (Erie)	10	1	2	30	311	1471
Farmington (Ontario)	12	0	0	0	5	1487
Hamlin (Monroe)	4	0	2	8	15	1495
LeRoy (Genesee)	3	1	4	0	5	1454
Lockport (Niagara)	2	6	3	0	8	1467
Pavilion	0	0	1	18	136	1454
Penn Yan (Yates)	8	0	1	8	16	1609
Seneca Castle (Ontario)	225	0	1	0	5	1523
Spencerport (Monroe)	2	6	7	0	2	1642
Waterport (Orleans)	4	2	2	0	3	1495
Williamson (Wayne)	0	0	0	0	0	1425
ECB - European Corn Borer WBC - Western Bean Cutworm						

CEW - Corn Earworm FAW - Fall Armyworm

NA - not available

DD - Degree Day (modified base 50F) accumulation

Late Blight Risk

Carol MacNeil and John Gibbons, CCE Cornell Vegetable Program

Late blight (LB) has now been confirmed in Niagara County. LB is on tomatoes and/or potatoes in Genesee, Livingston, Monroe, Steuben, Wayne, Wyoming, Yates, Tioga, Oneida and Ulster counties in NYS. In most cases samples were submitted, and in all cases the LB strain was determined to be US-23, sensitive to mefenoxam (Ridomil, etc.). LB has also been confirmed in Erie, PA, and in Ontario, Canada. Aroostook and Penobscot counties in Maine also report LB.

<u>Blight unit (BU)</u> accumulations have been variable across the region (see chart). There are several sites where BUs are high enough to warrant a 5 day fungicide spray interval. Do not exceed a 7 day interval as <u>Fungicide (loss) Units</u> are at or very near the threshold for a spray, even if BUs are not. Use of the full LB <u>Decision Support System (DSS)</u>, and your experience, may indicate a different interval is advisable. To reduce <u>tuber</u> <u>blight</u> the use of Ranman (high rate) or Presidio, with a mixing partner, is recommended as potatoes size. Gavel, Zing!, or Forum plus a mixing partner, can contribute to reduced tuber blight.

Late Blight Risk Chart, 8/04/15³

Location ¹	Blight Units ²	Blight Units ²	Location ¹	Blight Units ²	Blight Units ²
	7/29-8/04	8/05-8/07		7/29-8/04	8/05-8/07
Appleton	6	16	Kendall	24	19
Arkport	53	17	Lodi	18	12
Baldwinsville	22	20	Lockort/ Niagara F. 28		19
Bergen	16	19	Lyndonville	41	17
Buffalo	21	16	Medina	23	19
Butler	36	18	Penn Yan	26	19
Ceres	38	15	Rochester	34	19
Elba	55	19	Sodus	26	19
Farmington	16	18	Versailles	17	18
Gainesville	54	20	Wellsville	23	13
Geneva	0	12	Williamson	17	19

Past week Simcast Blight Units (BU)
 Three day predicted Simcast Blight Units (BUs)

3 Threshold = 30 BUs (susceptible variety, last fungicide-shorter residual)

CAUTION: Do <u>not</u> use the Simcast LB forecast through the NYS IPM NEWA website until further notice as there are currently inconsistencies in the information. If you are interested in details about the full DSS forecast contact Carol MacNeil at crm6@cornell.edu or 585-313-8796.

Best Control of Onion Thrips in Cabbage

Christy Hoepting, CCE Cornell Vegetable Program

Onion thrips (OT) are often considered the most important insect pest of cabbage. The feeding of these tiny insects causes unsightly brownish blisters and scarring on the leaves of cabbage heads, often several layers deep (Fig. 1). Damaged leaves need to be trimmed before cabbage can be marketed resulting in considerable economic losses in yield and grade.

When possible, the use of onion thrips-tolerant varieties can go a very long way towards minimizing losses from onion thrips. For example, summer cabbage varieties, Capture (Bejo - 2733), Celebrate (American Takii - T541) and Benelli (Bejo) exhibited excellent thrips tolerance in our 2009 Cornell trial. Here, Celebrate had virtually no OT damage, compared to Bajonet, which had more than 4 layers affected. Information on the relative tolerance/ susceptibility of storage, kraut and summer cabbage varieties evaluated in Cornell trials from 2005 to 2009 is available online at the new Cornell Vegetable Program website: <u>http://cvp.cce.cornell.edu/</u>, click on "cabbage" in the sliding menu, and you will need to "view the complete list of cabbage content" to see all the reports.

When onion thrips-tolerant varieties are not an option, the most effective insecticide is the active ingredient imidacloprid such as Admire. Several years of Cornell studies (Shelton *et. al.* 2003, 2004, 2008, 2010) have consistently found that Admire provided the best control of OT when applied to the soil as a directed spray to the base of plants at transplanting and 4 weeks after transplanting. Here, Admire Pro reduced OT dam-



Figure 1. Onion thrips feeding in cabbage resulting in unsightly brown blister and scarring that needs to be trimmed at the expense of yield and labor. *Photo: Christy Hoepting, CVP*

age from 6 to 2 layers. The next best insecticides for OT control in these trials were foliar applications of Provado (which has been replaced with Admire Pro) and Movento, followed by Assail and Radiant, then dimethoate (discontinued), and finally Warrior. Admire can be an especially economic OT control option for susceptible varieties of summer cabbage. Note that Admire Pro is a different formulation than Admire 2F and is used at different rates. There are several generic 2F formulations of imidacloprid and some have control of OT in Brassicas on the label and some do not. For example, Alias 2F does, while Couraze 2F and Montana 2F do not. Imidacloprid also controls aphids and swede midge.

Late Summer Cover Crops

Carol MacNeil, CCE Cornell Vegetable Program (info from T. Bjorkman, Cornell)

(Be sure to visit the Soil Health Seminar Center and Cover Crop/Interseeding Plots at Empire Farm Days next week. See Upcoming Events for speakers and activities.)

Try to get a cover crop established when the weather and soil moisture permit. Cover crops can crowd out weeds, loosen the soil and improve soil aggregation, scavenge leftover nitrogen, and legumes can "grow" nitrogen for next year's cash crop.

Forage radish, planted preferably between August 1 – 20, is effective at breaking up plow layer compaction and crowding out weeds. This crop forms thick, white tap roots that can reach lengths of 8-14. A thinner, fibrous tap root penetrates much deeper into the soil. The fleshy roots freeze and die in mid-winter. Open channels from all the roots allow water to percolate through the soil more quickly. Be sure you get forage radish seed instead of forage turnip. Varieties of forage radish include Cedar Meadow Forage Radish, Tillage Radish and Groundhog. If forage radish follows vegetables it often has sufficient nitrogen (N), but after wheat apply 50 lbs/A N for best growth. Loosen the soil surface. When radish is planted alone drill no more than 8 lb/A. Roll lightly after seeding. An alternative to applying N is to cut the radish seeding rate back to a third and seed with the standard rate of red clover as an N source. Another tactic is to seed a third rate of radish with 40 lbs/A wheat or rye, and 50 lbs N/acre. The wheat or rye will carry the N over until your cash crop needs it. After mild winters radish survivors should be killed in early spring before seeds set. Do not use in close rotation with crucifer crops.

Medium red clover, planted from mid-August through mid-September, can grow a substantial amount of the N that your cash crop will need next season. A good stand of red clover that gets established by late August, with good growing conditions, can produce 80 – 100 lbs/A of N. Most of the N is fixed during May, however. Seed at 15 Ib/A with an inoculant for red clover. You can broadcast onto prepared ground or sow it with a grass seeder. A wheat nurse crop seeded at 40 lb/acre is recommended. The wheat keeps down weeds during clover's slow establishment. Volunteer wheat in a recently harvested field should work. Another benefit: The grass's N uptake stimulates the clover to produce more N and helps carry the N through until the next cash crop will need it. Warning! Red clover is difficult to kill chemically in the spring, though it can be buried with tillage.

Oats planted from mid-August to mid-September will grow some organic matter, crowd out weeds, and provide winter-killed ground cover that's easily incorporated for early spring vegetables. Oats are also useful as a nurse crop with legumes. Oats establish more easily than some other cover crops. For seeding after vegetables, or when using oats as a nurse crop with legumes, no nitrogen fertilizer is required. Drill 80-110 lb/A oats; broadcast 110-140 lb/A. Increase the rate 10% in late September. When seeding oats with a legume use a half rate of oats. Note: Some growers are seeding half or third rates of small grain cover crops for ease of management in the spring, however federal programs do not accept the lower rates at this time.

Hairy vetch planted by September 15 will over-winter, and the legume has the potential for fixing up to 150 lbs/A nitrogen (N). Most of the nitrogen is fixed during May, however, so seed it ahead of a mid-June cash crop planting. Vetch needs to be drilled into a soil with good moisture for a reliable stand. Seed it at 40 lbs/A and be sure to inoculate to ensure N fixation. Vetch should be seeded with a grass nurse crop to reliably overwinter. Wheat overwinters and is likely the best nurse crop in most situations. Seed it at the low rate of 40 lbs/A. The vetch and grain seed can be mixed together in the drill. In the spring incorporate at early vetch bloom, typically late May,



A well-spaced and fertilized radish plant growing well. *Photo: Thomas Bjorkman, Cornell*

for maximum N fixation and minimum vetch seed production. Caution: If you raise small grains don't plant hairy vetch. It has hard seed that will germinate in future small grains producing vetch seed that will contaminate the grain.

Annual ryegrass planted from late August to mid-September will overwinter, producing a dense sod which improves soil aggregation, reduces surface soil compaction, and picks up and carries over any leftover N. Ryegrass grows rapidly and is good for fall weed suppression. There is often enough N left in the soil after vegetables. If there is not, 30 lb/A of N can double fall growth of the ryegrass. If the soil surface is moist, broadcasting without covering is effective. Seed ryegrass at 10 lb/A if drilled into reasonably moist soil, and 15 lb/A in dryer soil. Broadcasting requires 15-20 lb/A. Ryegrass can be very difficult to kill chemically in the spring.

For seed sources, costs, and more details on these cover crops go to the Cover Crops for Vegetable Growers website at <u>http://</u> <u>covercrops.cals.cornell.edu/</u> •

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

Soil Health Speakers, Cover Crops/Interseeding at Empire Farm Days

August 11-13, 2015 | 9:30 AM each day Tuesday – Cover Crops Wednesday – Reduced Tillage Thursday – Nutrient Management Lot #922, Rodman Lott & Son Farms, Rt 414, Seneca Falls



A nationally renowned soil scientist and industry speakers will kick off each day's topic at 9:30 am, followed by an experienced grower panel. Cover crop demos, and inter-seeded soybean plots and equipment, will be nearby. Lunch will be sponsored by Kings Agriseeds for those attending the morning session. NRCS, SWCD, Cornell and CCE Cornell Vegetable Program staff will be present to offer technical assistance or describe cost-share programs. For info on Empire Farm Days go to: <u>http://empirefarmdays.com/</u> For more info on the soil health program contact Paul Salon, USDA-NRCS at: <u>paul.salon@ny.usda.gov</u> Organized by the NYS Soil Health Working Group

Vegetable Pest and Cultural Management Field Meeting

August 12, 2015 | 7:00 PM - 9:00 PM Seneca County – Jesse Stoltzfus farm, 5907 Rt 414, Romulus, NY 14541

These courses will demonstrate pest management in fresh market vegetables in both field and greenhouse (high tunnel) vegetables; primarily for those growing for wholesale auction. A hands-on demonstration of weed, insect and disease identification in vegetables including management options such as inter-row cover crops, grafting and where appropriate, spray options will be used to educate growers. Judson Reid, Senior Extension Associate with the Cornell Vegetable Program along with CCE associates Darcy Telenko, Robert Hadad and Elizabeth Buck will instruct participants and facilitate peer-based learning. Details on each topic will focus on field observations at these farms. DEC recertification credits will be offered. No cost to attend. Contact Judson Reid at 585-313-8912 for more information.

Fresh Market Vegetable Twilight Meeting in Eden

August 19, 2015 | 6:00 PM - 8:30 PM W.D. Henry & Sons, Inc., 7189 Gowanda State Rd, Eden, NY 14057



FREE to attend. DEC credits have been applied for. Contact Darcy Telenko at 716-697-4965 or <u>dep10@cornell.edu</u> for more information.

Fresh Market Potato Varieties, Late Blight, and Insect Management Meeting

September 2, 2015 | 5:30 PM - 8:45 PM

Williams Farms, 5077 Russell Rd, Marion, NY 14505

View standard and new fresh market potato varieties and lines in potato breeder Walter DeJong's Cornell trial, hear how to reduce risk in this year's late blight epidemic from Plant Pathologist Bill Fry, and discuss Colorado potato beetle and other insect management. 1.25 DEC credits and CCA credits will be available.

Cost: Enrolled in the Cornell Vegetable Program - \$10; <u>Not</u> enrolled in the CVP - \$15. **Preregister for dinner by Thursday, August 27 –** Carol MacNeil at <u>crm6@cornell.edu</u> or 585-313-8796. If you have special needs: Call a week ahead so we can accommodate you. **Interested in sponsor opportunities?** Contact Angela Parr at: <u>aep63@cornell.edu</u>

2015 NYS Dry Bean Field Meeting

September 17, 2015 | 5:15 PM - 7:45 PM Paul Stein & Sons Farm, Caledonia, NY



View six standard and new black bean varieties in a grower-planted trial. Get an update on Sclerotinia white mold control, including info on fungicide resistance, and bacterial diseases. Hear about progress in breeding varieties with pods high on the plant, ensuring not only easier harvest, but also foliage drying to reduce disease pressure. Western bean cutworm moth counts were very high this year. Hear reports on pod and/or bean damage. DEC and CCA credits have been requested.

Cost: Enrolled in the Cornell Vegetable Program - \$10; <u>Not</u> enrolled in the CVP - \$15. **Preregister for supper by Monday, September 14 –** Carol MacNeil at <u>crm6@cornell.edu</u> or 585-313-8796. If you have special needs: Call a week ahead so we can accommodate you. **Interested in sponsor opportunities?** Contact Angela Parr at: <u>aep63@cornell.edu</u>





Weather Charts

John Gibbons, CCE Cornell Vegetable Program

Weekly Weather Summary: 7/28 - 8/03/15

	Rainfall (inch)		Temp (°F)	
Location	Week	Month	Мах	Min
		July		
Albion	0.35	1.46	93	60
Appleton, North	0.26	0.63	91	60
Baldwinsville	0.38	3.42	90	60
Buffalo*	0.03	2.42	90	62
Butler	0.59	2.75	91	58
Ceres	0.31	1.95	89	49
Elba	0.36	2.94	88	55
Farmington	0.44	NA	90	57
Gainesville	0.45	3.20	88	55
Geneva	0.31	3.27	89	58
Lockport	NA	NA	NA	NA
Lodi	0.40	4.22	92	58
Penn Yan*	0.26	3.73	88	62
Rochester*	0.34	3.46	91	61
Romulus	NA	NA	89	60
Silver Creek	0.69	5.19	87	63
Sodus	0.26	2.28	91	58
Versailles	0.21	NA	91	61
Williamson	0.01	0.10	91	59

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 – August 3, 2015

Location	2015	2014	2013
Albion	1603	1463	1575
Appleton, North	1368	1277	1396
Baldwinsville	1603	1598	1638
Buffalo	1637	1509	1682
Butler	1615	1551	NA
Ceres	1420	1319	1364
Elba	1239	1192	1424
Farmington	1532	1465	1498
Gainesville	1279	1169	NA
Geneva	1564	1501	1585
Lockport	NA	NA	NA
Lodi	1708	1642	1770
Penn Yan	1663	1596	1663
Rochester	1704	1601	1731
Romulus	1596	1542	NA
Silver Creek	1493	1426	1582
Sodus	1424	1414	NA
Versailles	1508	1415	1573
Williamson	1458	1409	1542

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

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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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Cornell University Cooperative Extension Cornell Vegetable Program

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