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Weekly Vegetable Update

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Eastern New York Crop Updates:

As the season progresses many of our pests and diseases become widespread and we can take a break from regional updates to focus on what we are seeing crop-by-crop. Here's some of the insights from the field this week:

Tomatoes: Some areas are experiencing severe Septoria outbreaks, with susceptible varieties in tough environments becoming quickly defoliated. Early blight is also widespread where fruit set is already heavy, though infections do not appear to be unusually severe. Late blight is still restricted to Columbia County, with no new finds either within or outside the county. However, growers are encouraged to keep on their tight spray schedule, since inoculum may be present.

Bacterial diseases (mostly canker) have all spread aggressively through plantings where these diseases are present. Severe outbreaks of bacterial pathogens can make fruit harder to market, and canker severely damages the plant. See previous editions of the newsletter for control information on all these diseases.

Tomato hornworms are bad enough in some places to cause some real damage, especially in high tunnels. Left unchecked, each caterpillar can feed on numerous fruit, and certainly make a big mess. Stinkbugs are also fairly common now in tomato plantings and should not be ignored. Left untreated they can "sting" lots of fruit and cause some unmarketable fruit, especially in small fruited varieties like cherry and grape tomatoes. Farmers should not attempt to save seed from plantings showing symptoms on leaves or fruit.

Spider mites are showing up in high numbers on high tunnel tomatoes, eggplants and beans on some farms. Because most are harvesting these crops, miticides such as Agri-Mek which has a 7 day PHI will probably not work into the schedule. One alternative may be Vydate which has a 1 day PHI but does have 48 hour REI. Highly refined horticultural oils such as JMS stilet oil (OMRI approved) can be used against mite eggs and other stages, to avoid phytotoxicity, be sure to apply when humidity is low so the product dries quickly also avoid high temps. Always check pesticide labels to make sure the crop and pest are listed as well as other application instructions.

Sweet Corn: Second generation European corn borer is starting to emerge and we are starting to catch more Western Bean Cutworms in the last couple weeks. More information can be found in this week's issue on this pest. Sap beetles and birds are also continuing to be problematic in sweet corn.

Potatoes: Early harvests of new potatoes continues with reports of good yields and quality potatoes. Leaf hoppers are still easily found in most plantings and we should continue to scout and treat when necessary. Early blight has also moved into plantings.



Spider mites on high tunnel tomatoes. Image: CLS

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Eastern New York Crop Updates, continued from previous page

Garlic: Garlic is drying nicely throughout the region. We are having our third year in a row of good drying weather, though we aren't out of the woods just yet. An issue not seen in large amounts until this year is a kind of botrytis which turns the wrapper leaf bright orange. I affectionately named it the Orange Scourge, but was told that was not helpful and will not call it that any more. This disease is, like *Aspergillus*, a surface issue. Keeping garlic in dry (below 70%) storage after it is fully dried should keep this issue in check, and most of it will be removed during the cleaning process. Problems will show up if garlic is not cleaned or is stored in a moist environment.

Onions: Fresh market growers seem to be having a generally good onion crop, with relatively low thrips numbers in most locations and relatively low disease pressure as well. There has been a fair amount of rain check and environmental damage to onions, but it hasn't effected sizing or bulb quality. Growers are harvesting early onions now, and hoping that diseases and pests hold off until the later onions are maturing.

Cole Crops: Cabbage worms are really starting to show up now, and should be controlled while they are small if at all possible. See the article in this issue of the newsletter for information on telling these pests apart and for efficacy data from a trial on Long Island, including organic and conventional products.

Cucurbits: Continued precipitation and wet soil is keeping *Phytophthora* blight moving throughout cucurbit plantings known to have the disease and some new fields. Powdery mildew can be found in nearly all fields scouted in the last week which is no surprise. See Weekly Veg Update Volume 2 Issue 15 July 24 2014 for powdery and Downy mildew fungicide programs.



GAPS Help?

If you want help with writing your GAPs plan or need to get ready for your first inspection, contact Maire Ulrich mru2@cornell.edu. We have a staff person that is prepared to help you take the next steps needed to get that inspection and to be GAPs certified. This Fall, we plan on having more 2-day classes, across the region for those who have yet to get started with their plans or investigating "what it takes". Please call 845-344-1234, and ask for Maire, if you have questions or want to book an appointment with our GAPs specialist.



2012 Census of Agriculture Released

Source: U.S. Dept. of Agriculture, http://www.agcensus.usda.gov/About_the_Census/

The Census of Agriculture is the leading source of facts and figures about American agriculture. Conducted every five years, the Census provides a detailed picture of U.S. farms and ranches and the people who operate them. It is the only source of uniform, comprehensive agricultural data for every state and county in the United States. Participation by every farmer and rancher, regardless of the size or type of operation, is vitally important. By responding to the Census, producers are helping themselves, their communities and all of U.S. agriculture.

The 2012 Census of Agriculture collected information concerning all areas of farming and ranching operations, including production expenses, market value of products, and operator characteristics. This information is used by everyone who provides services to farmers and rural communities - including federal, state and local governments, agribusinesses, and many others. Census data is used to make decisions about many things that directly impact farmers, including:

- community planning
- store/company locations
- availability of operational loans and other funding
- location and staffing of service centers
- farm programs and policies



For 2012 Census of Agriculture results, go to <http://www.agcensus.usda.gov/Publications/2012/>

Bacterial Spot on Pepper

By Darcy Telenko, CCE Cornell Vegetable Program

Bacterial spot is appearing and spreading in peppers as high humidity and moisture conditions continue to favor the disease. Bacteria spot is caused by *Xanthomonas euvesicatoria* and *Xanthomonas perforans* and one of the most important disease affecting peppers in New York. Symptoms start as small, irregularly shaped, water-soaked lesions on the underside of the leaves that can grow up to ¼ inch in diameter, turn dark brown, and become raised. These necrotic spots may be found on leaves, stems and fruit and as the disease progresses the lesions may coalesce resulting in large necrotic areas. Severely infected leaves will turn yellow and eventually fall off increasing the chance of sunscald on the fruit. Fruit may also develop raised, scab-like spots generally near the stem end of the fruit where water and water-splashed inoculum collect. Favorable conditions for disease include high relative humidity and free moisture on the leaves. Symptoms can appear when RH is greater than 85% for a few hours during several days. Splashing rain and movement between wet plants can spread bacteria.



Bacterial Spot Management

- Resistant varieties with tolerance to bacterial leaf spot (BLS) race 1, 2, 3 include Red Knight, Ironsides, Early Sunstation, Lexington, Lafayette, Aristotle, Boynton Bell, X3R Aladdin, X3R Sir Galahad, X3R Camelot, X3R Wizard, Intruder, Legionaire, Karisma, and Commandant.
- Crop rotation – a minimum two-year rotation away from tomato and pepper crops.
- Use only disease-free, certified seed - hot water treatment is an option for non-treated seed that could be contaminated – it will kill bacterium inside and outside the seed, but can reduce germination and vigor if done incorrectly. Treat seed with Thiram after hot water treatment.
- Plant only disease-free and certified transplants.
- Infected crop debris should be destroyed as soon as possible after harvest to remove inoculum source for future plantings.
- Keep greenhouse dry and avoid splashing water reduce spread in plant beds and flats.
- Sprays should be applied before and during periods of rain and high humidity. Plant surfaces need to be protected since once inside the tissue bacterium cannot be controlled.

Compounds Available for Management of Bacterial Spot on Pepper						
Name	Common Name	FRAC Group	Rate/A	REI	PHI	Notes
Actigard 50WG	acibenzolar-S-methyl	P1	0.33-0.75 oz	12	14	For use on Chili peppers only.
Champ or OLP	copper compound	M1	1.3-2 pt	48	2	See label for details. Copper compounds may help reduce secondary spread, but effectiveness limited by rainfall and dew formation.
Tanos	famozadone+cymoxanil	11+27	8-10 oz	12	3	Suppression of bacterial leaf spot. Do not make more than one sequential application of Tanos before alternating with a different MOA (not group 11). Must be tank mixed with contact fungicide such as copper, using least minimal labeled rate.
Agri-mycin 17 or OLP	streptomycin sulfate	25	0.5 lb/50 gal	12	0	Not for use in the field. Begin application in the 2-3 leaf stage and may be applied only prior to transplanting.

OLP = other labeled product. MOA= modes of action.

Identifying Cabbage Worms and Determining the Best Control

Lepidopteran pests of cole crops are becoming quite prominent now. It is important to know which pest(s) you are dealing with, because they have different sensitivities to the available insecticides. Below are detailed descriptions, followed by a table which lists the organic and conventional pesticides available along with their effectiveness for each pest.

Source for life cycles and descriptions comes from "Pests in the Northeastern United States" edited by W.T. Wilsey, C.R. Weeden, and A.M. Shelton, Cornell University.

Imported Cabbage Worm: Eggs of the ICW are laid singularly on the underside of the leaves and are bullet shaped and off-white when first laid, turning light to dark yellow in color. The larvae start out as small velvety green caterpillars and after feeding for 2 to 3 weeks turn dark velvety green with a light yellow stripe down their back and a broken stripe along each side of the body. When mature, they are approximately 1 1/4 inches long.



Larvae and pupae chrysalis of the Imported Cabbage Worm. *Photo courtesy of Cornell University*

Diamondback Moth: Eggs of the DBM are small round, yellowish-white and laid singly or in groups of two or three on the underside of lower leaves or on the lower stalks. Larvae upon hatching, begin mining within the leaf tissue and later instars feed on heart leaves of young plants and underside of the leaf surfaces of more mature plants. Mature larvae are 1/3 inch long, pale greenish-yellow, and pointed at both ends. Diamondback larvae can be distinguished from other young pest species by their habit of actively wriggling or dropping from the leaf on a silken thread when disturbed. The pupa develops within a delicate, loosely spun, open lacework cocoon that is attached to the leaves and stems of the plant.



Diamondback moth pupa (left) and larva (right). Note the forked tail on the larvae. *Photo courtesy of Manitoba Agriculture, Food and Rural Initiatives*

Cabbage Looper: Eggs are normally laid on the underside of the lowest leaves and are round, ridged, white, and approximately the size of a pinhead. Looper larvae feed for 2 to 4 weeks and pass through five instars. Older larvae are light green with a white stripe along each side of the body and two white stripes along the back. First instar larvae have a black head capsule, but by the second instar, this is lost and the head capsule remains green. Mature larvae are approximately 1-1/2 inches. When disturbed the larvae will raise its back causing a "looping" movement. Young pupae are a light greenish color and gradually turn dark brown when mature. They are 3/4 inch long and wrapped in a delicate cocoon of white tangled threads. Pupae are usually found on the underside of lower leaves. -CDB



Cabbage looper feeding on the underside of a cabbage leaf and a mature pupae wrapped in its cocoon. *Photo on left courtesy of Utah State; right courtesy of Cornell Univ.*

Relative Efficacy of Insecticides for Control of Worm Pests in Cole Crops

Following is a list of insecticides labeled for use on various cole crops with tentative efficacy ratings for control of imported cabbage worm (ICW), small and large cabbage looper (CL) and diamondback moth (DBM), which was put together by Cornell researchers in Long Island. Growers and other researchers may have somewhat different opinions and results vary according to rates, application method and frequency, location, etc. so selection of controls should not be made solely based on this chart. Not all materials are labeled for all crops or areas - check labels. For most cole crops, addition of a spreader-sticker is advised. *Source: Veg Edge Weekly July 30, 2014*

Material, Formulation and Rate	IC W	Sm CL	Lg CL	DBM ³
Diamides (Group 28):				
Coragen (3.5 – 5 fl oz)	xxx	xxx	xxx	xxx
Voliam Xpress ⁹ (5-9 fl oz)	xxx	xxx	xxx	xxx
Synapse WG (3-5 fl oz) & Belt & Belt SC (2-2.4 fl oz) ¹⁰	xxx	xxx	xxx	xx
Spinosyns (Group 5):				
Radiant SC (5-10 fl oz)	xxx	xxx	xxx	xx
Entrust SC (1.5 – 4 fl oz)	xxx	xxx	xx	xx
Indoxacarb (Group 22):				
Avaunt 30WG ⁶ (0.15 – 0.22 lb)	xxx	xxx	xxx	xxx
Avermectin (Group 6):				
Proclaim 5G (2.4 – 4.8 oz)	xxx	xxx	xx ²	xxx
Pyrethroids (Group 3A):				
Warrior II with Zeon Technology (1.28 – 1.92 fl oz)	xxx	xxx	xx	x
Endigo ZC (4 – 4.5 fl oz) ⁸	xxx	xxx	xx	x
Danitol 2.4 EC (10.6 – 16 fl oz)	xxx	xxx	xx	x
Brigade/Capture 2EC (2.1 – 6.4 fl oz)	xxx	xx	xx	x ²
Pounce/Ambush (0.05 – 0.2 lb ai)	xxx	xx	x	x
Baythroid 2 (1.6 – 2.4 fl oz)	xxx	xx	x ²	x
Perm-Up 3.2 EC (2-4 fl oz)	xxx	xx ²	x ²	-
Mustang Maxx (2.24 - 4 fl oz)	xxx	xx ²	x ²	-
Asana XL 0.66EC (5.8 – 9.6 fl oz)	xxx	x ²	x ²	-
Hero (4-10.3 oz)	? ⁷	?	?	?
Bts (Group 11):				
<i>Bt kurstaki</i> (see labels) (Biobit, Javelin, DiPel, Condor, Crymax)	xxx	xx ²	x ²	x ²
<i>Bt aizawai</i> (see labels) (Xentari, Agree, Ketch)	xxx	x	x	xx ⁴
OPs (Group 1B):				
Orthene 97 (1.0 lb)	xxx	xx	xx	x
Carbamates (Group 1A):				
Lannate LV 2.4L (1.5 – 3 pt)	xxx	x ²	x ²	x ²
Larvin 3.2F (16 – 40 fl oz)	xxx	x ²	x ²	x ²
Sevin 80 Solupak (1.25-2.5 fl oz)	x	-	-	x

Table Key and Footnotes:

xxx = most effective (usually good control expected)

x = least effective (fair or poor control)

- = not labeled or not effective.

Not all formulations listed.

Rates in amount of formulated product unless otherwise indicated.

¹ 4.5 – 6 oz for CL

² higher rates needed

³ Where insecticide resistance is not a problem better control of DBM with some materials may be expected

⁴ *Bt aizawai* may provide better control of DBM where populations are resistant to *Bt kurstaki*

⁵ some incidental control

⁶ Avaunt is not labeled for use on Long Island.

⁷ Has not been trialed in University studies.

⁸ a premix of Warrior + Actara/Cruiser.

⁹ A premix of Coragen + Warrior.

¹⁰ Belt is replacing Synapse for all vegetable uses.

Sweet Corn Report

In the last couple of weeks we have been catching low numbers of Western Bean Cutworm (WBC) moths in our traps. Although we have been trapping for these moths for a couple of years, this is a fairly new pest for us. In other states and in Western NY, WBC have become a significant pest of sweet corn, snap beans and dry beans. We wanted to bring your attention to this pest as it could become a problem in some plantings. Below is information on pest identification/damage, how to scout for this pest and thresholds from Marion Zuefle, Vegetable IPM Extension Area Educator with the New York State Integrated Pest Management Program:

“Michigan State University recommends scouting for WBC egg masses when cumulative trap catch numbers reach 100 moth/trap for field corn. Whether this guideline also pertains to sweet corn is not known. Therefore it is recommended that all fields that are in the whorl or early tassel stage be scouted for egg masses with a 4% threshold for processing sweet corn and a **1% threshold** for fresh market sweet corn. I scouted one field this week that had a cumulative trap catch of only 5 WBC moths and found one egg mass. WBC will usually lay eggs on the upper side of the top 1-3 leaves of pre-tassel corn, close to the leaf base. After tasseling has finished WBC seek out younger corn or dry beans. It is important to scout late whorl and early tassel-emergence fields as these are most at risk. To scout for egg masses check the top 3 leaves of ten corn plants in ten locations throughout the field. The eggs are easy to observe if you view the leaf while holding it towards the sun. The egg mass will appear as a distinct shadow (see photo).

According to data from the University of Nebraska, 50% of WBC emerge when the accumulated degree-days (base 50%) reach 1422 (see chart). It takes

between 5-7 days for eggs to hatch. It is critical that sprays are timed before the larvae have a chance to enter the ear. The egg mass will become purple in color approximately 24 hours before egg hatch (see photo). After hatching larvae will spend a few days feeding on the tassel before moving down to the ear. Most insecticide sprays used to control ECB will also control WBC.”

Description: First-instar western bean cutworm are dark brown, with diamond-shaped markings on their back. As the larvae mature, they become light tan to pink in color and the markings on their back become more distinct. Western bean cutworm larvae that are third-instar and older may be distinguished from other cutworms and caterpillars by three distinct stripes right behind the head. (Source: Kelly A. Cook, *Western Bean Cutworm Factsheet*, University of Illinois Integrated Pest Management Program: http://ipm.illinois.edu/vegetables/insects/western_bean_cutworm/)

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<i>Degree day accumulations in relation to percent moth emergence (begin May 1, base 50°F).</i>	
Accumulated Degree-days	% Moth Emergence
1319	25%
1422	50%
1536	75%



WBC egg mass shadow.
Photo: T. Baute



WBC egg mass.



WBC eggs become purple prior to hatch.
Photo: Marlin Rice

Sweet Corn Report, continued from previous page

Western Bean Cutworm Larvae. *Left photo courtesy of Montana State University, right photo courtesy of Marlin Rice, Iowa State University.*



Insecticide applications are futile after larvae have moved under the husks.

Photo courtesy of South Dakota State University



Injury on dry beans caused by western bean cutworm larvae. *Photo courtesy of Univ. of Idaho.*

Eastern NY Commercial Horticulture Website

The Eastern NY Commercial Horticulture Team is proud to announce that their updated website is up and running. For online class registrations, announcements, older issues of our newsletters, and more, please visit

<http://enych.cce.cornell.edu/>. We hope you bookmark it on your computer and begin using it as your 'go to' website for production and marketing information. Email or call any of the educators with questions or comments on the website – we want to make it work for YOU!



Soil Health Field Day

August 21, 2014 from 4:30-8:30 pm

Kinderhook Creek Farm, Inc., 5168 South Stephentown Road, Stephentown, NY

Soil is the backbone of every farm and needs to be managed for maximum production. Are you using the most current techniques for the best results?

Join us at our Soil Health Field Day where you will enjoy:

- Dinner on the farm
- Demonstration cover crop plots
- A farmer panel
- Soil health demonstrations
- Equipment demonstrations

Our speakers include:

- Olga Vargas, NRCS Soil Scientist
- Paul Salon, NRCS Plant Materials Specialist
- Frank Gibbs, Certified Professional Soil Scientist and Certified Crop Advisor

1.5 DEC Credits and 4 CCA Credits Available. The meeting is FREE, but please RSVP by August 18, 2014. For more information or to RSVP contact Marcie Vohnoutka at (518) 272-4210 or mmp74@cornell.edu.

Sweet Corn Trap Catches for the Week Ending July 20th					
Location	ECB-E	ECB-Z	Corn Earworm	Fall Armyworm	W. Bean Cutworm
Albany	5	0	0	0	1
C. Clinton	0	0	0	23	4
S. Clinton	0	0	0	0	7
Columbia	2	0	3	1	0
Fulton	0	0	3	0	12
Orange	0	0	0	4	0
Saratoga	0	0	N/A	N/A	N/A
Schoharie	0	0	3	0	0
C. Ulster	3	13	0	12	1
N. Ulster	0	14	0	4	0
C. Washington	5	0	0	0	0
N. Washington	1	0	0	0	2

2014 Weather Table—This chart is compiled using the data collected by Northeast Weather Association (NEWA) weather stations. For more information on NEWA and a list of sites, visit <http://newa.cornell.edu/> This site has information not only on weather, but insect and disease forecasting tools that are free to use.

2014 Weekly and Seasonal Weather Information						
Site	Growing Degree Information Base 50 ^o F			Rainfall Accumulations		
	2014 Weekly Total 7/28– 8/3	2014 Season Total 3/1 - 8/3	2013 Season Total 3/1 - 8/3	2014 Weekly Rainfall 7/28– 8/3 (inches)	2014 Season Rainfall 3/1 - 8/3 (inches)	2013 Total Rainfall 3/1 - 8/3 (inches)
Albany	142.0	1720.2	1732.0	0.48	7.39	24.18
Castleton	130.1	1623.7	1742.7	1.16	8.61	22.45
Clifton Park	128.2	1557.8	1643.6	0.99	9.26	24.68
Clintondale	136.0	1733.7	1868.6	2.06	10.18	16.35
Glens Falls	124.3	1542.3	1501.0	1.24	10.94	20.09
Guilderland	126.5	1563.0	1649.5	N/A	N/A	N/A
Highland	139.1	1724.2	1854.4	0.47	11.61	19.25
Hudson	139.5	1740.4	1822.2	0.63	9.83	18.49
Marlboro	135.3	1658.6	1790.7	1.04	12.78	20.25
Montgomery	135.5	1687.5	1750.5	0.16	14.46	19.67
Monticello	104.5	1351.2	1406.5	N/A	N/A	N/A
Peru	109.4	1459.0	1513.5	1.46	10.13	18.28
Shoreham, VT	125.3	1533.5	1615.2	1.00	9.22	19.58
Wilsboro	109.2	1405.5	1489.4	N/A	N/A	20.68

Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any products is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension.

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