

## The Risk to Dry Beans of the New Pest, Western Bean Cutworm

Carol MacNeil and John Gibbons, CCE Cornell Vegetable Program, and Keith Waldron, NYS IPM Program, Field Crops (retired)

Western bean cutworm (WBC), originally a Western U.S. bean and corn pest, has been moving east, first reaching New York in 2009. Since WBC trapping was begun in NY in 2011 the season long moth catch/trap has increased every year. After the 2014 and 2015 season trace levels of suspected WBC damage was found in beans at three elevators in New York during cleaning of red kidney beans. The beans were from Cayuga, Livingston and Steuben Counties. Dry bean pods with WBC feeding damage were first seen in one Western NY field in 2015. Only 1-2 pods with damage were found in two fields in 2016. One of the fields had been sprayed. Whether damaged beans are found at elevators this fall and winter remains to be seen.

Season total average WBC moth catches in dry bean fields, 2011-2016

	2011	2012	2013	2014	2015	2016
Average WBC moths/trap:	46	48	64	92	178	243* (173**)





WBC damage on dry beans. Holes are round, or may be irregular if very large, and may include much of the interior of the bean. Photo: Keith Waldron, NYS IPM Program



VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serving 12 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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Information provided is general and educational in nature. Employees and staff of the Cornell Vegetable Program, Cornell Cooperative Extension, and Cornell University do not endorse or recommend any specific product or service.

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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.



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The next issue of VegEdge will be produced November 1, 2016.

## Retirement Celebration to Honor Carol MacNeil's Contributions to CCE

On September 22, 2016, Cornell University and Cornell Cooperative Extension staff,

past and present, gathered with vegetable growers to honor Carol MacNeil's 40 years of contributions to Extension and her personal impact on their careers. Many hugs and well wishes were shared, and numerous acknowledgements were spoken during the open mic portion of that party.



Trap counts of WBC moths can pinpoint when to scout bean pods for damage, to determine whether an insecticide spray is needed. WBC pheromone bucket traps were set up in late June at 16 dry bean fields. CVP and CCE county staff, and a consultant, checked the traps for moth counts weekly. Peak WBC moth flights occurred the end of July.

The highest season total moth catch/trap in the dry bean fields occurred in Riga and Attica, with 653 and 464 moths over the season, respectively, well over the threshold of concern of 100 moths/trap. Only one damaged dry bean pod was found in the Riga field, but both bean fields had been sprayed with an insecticide. Caledonia W and S, Cohocton N, Geneva, Avoca, Stafford, Pearl Creek and Groveland also exceeded 100 moths/trap (from 135 to 261). The other traps, in Steuben Co. (Dansville, Wayland, Howard – 2, Cohocton – 2), caught a total of 6 to 78 moths/trap over the season.

Abby Seaman, NYS IPM Program - Vegetables, conducted a trial in 2 additional organic dry bean fields in Wyoming Co. The beneficial parasitic insect, Trichogramma, was released in half of each field, with the hopes that it would control small WBC larvae. Two pods with damage were found in each half (treated and untreated) of the field where 156 moths were caught over the season, showing no difference in damage. WBC populations were relatively low. No damage occurred in the other field where only 38 moths were caught.

In 2016 the WBC moth catch reached the threshold of concern by peak moth catch, late July with, a cumulative catch of 100 moths/ trap. This occurred in all fields with traps in Genesee, Livingston, Monroe, Ontario and Wyoming Counties, and in 2 out of 8 traps in Steuben County. Therefore all growers were advised to scout for bean pod damage beginning around Aug 8 and continuing for 2-3 more weeks. Areas at most risk were defined as those where moth catches were highest, where eggs/larvae were found in nearby corn, or where WBC damage was present, or had been seen in beans in the past. Spray timing/insecticide recommendations, from Michigan State University, were shared. If dry beans have pods, and pod feeding is found during 30 minutes of scouting/field, MI and Ontario entomologists recommend an insecticide spray. Insecticides are very effective if applied 7-10 days from peak moth catch. Sprays a few days later are still quite effective. Longer lasting pyrethroids are recommended. Entrust is recommended on organic dry beans. Growers in higher risk areas tended to apply an insecticide both last year and this year. Dry bean pods that are beginning to dry down are less susceptible.

If present, WBC egg masses, larvae and damage can easily be found on corn plants. Only damage will be seen on beans, however, since WBC larvae on beans drop to the soil during the day. Scouting corn around peak moth catch can give an early warning of higher WBC pressure in the area.

When WBC larvae finish feeding they drop to the ground and burrow into the soil, constructing earthen chambers 5-10 inches deep, for overwintering. (*Temperatures below -20°F are needed to affect winter survival of WBC.*) Suggested factors contributing to risk of increasing WBC populations: high % of acres in reduced/no-till; lake effect weather – mild fall, deep snow cover; and high summer humidity.



WBC damage on bean pods, Western NY, 2015. Holes are round, or may be irregular if very large, and extend into the pod cavity. Fresh damage will not be brown. Photo: Carol MacNeil, CCE Cornell Vegetable Program

WBC is also a pest of field and sweet corn. WBC larvae have damaged organic sweet corn ears in areas with higher moth catches, such as in Erie County and near in the St. Lawrence Valley this year (Abby Seaman, NYS IPM Program). A few WBC larvae were found in field corn ear tips in late August in Niagara and western Orleans Counties (Nate Herendeen, WNYCMA), in addition to being found in the St. Lawrence Valley. Corn varieties with the Vip 3A gene is labeled for control of WBC. 2017 field corn varieties with resistance will be listed (Search for) The Handy Bt Trait Table, Michigan State University, in April, 2017. The Cry1F gene has not proven effective against WBC.

If you see suspected dry bean pod or seed damage in the 2016 crop contact Marion Zuefle at: <a href="mez4@cornell.edu">mez4@cornell.edu</a> or 315-787-2379, or Julie Kikkert at: <a href="jrk2@cornell.edu">jrk2@cornell.edu</a> or 585-394-3977 x404.

#### Thanks to:

The New York State Dry Bean Industry Committee for their support of this work, Eric Nixon of WNY Crop Management Assoc, Don Gasiewicz of CCE Wyoming Co, and DeLisa Drum and Stephanie Mehlenbacher of CCE Steuben Co, for their assistance, and to all the growers for their cooperation!

## Improve Soil Health with Good Soil Management

Carol MacNeil, CCE Cornell Vegetable Program (retired)

This is my last "Good Soil Management" article since I retired October 1<sup>st</sup>. I have sincerely enjoyed working with so many growers on a wide range of farms throughout the CVP Region, and wish you only good weather, good soil health, and the best of luck in the future!

Good soil health has become increasingly important for profitable crop production because of more frequent extremes of weather. If soils are in good health roots will grow deeper, reducing the negative effects of dry periods. (Healthy soils can't eliminate losses from extended Extreme Drought, however.) In addition, if soils are in good health excess rainfall will readily percolate down through the soil pores and earthworm channels. Many growers in the CVP region are working to improve their soil health.

Good soil management improves soil health, which can improve crop profitability. Work towards including several of these steps in your soil management plan!

- Be sure your tile drainage is functional (first!).
- Diversify your crop rotation, including small grains and/or hay, in addition to row crops.
- Increase the use of cover crops -Keep fields green year-round! Feed essential soil organisms.
- Reduce tillage for large seeded crops and transplants.
- Apply manure where practical (and within food safety limits).
- Be sure to have a soil nutrient/pH analysis every 3 years.



Earthworm channels in a healthy soil, 2014. Photo: Darcy Telenko, Cornell Vegetable Program

#### Conservation Innovation Grant to Help Growers Improve Soil Health

The Cornell Vegetable Program (CVP) was awarded an NRCS Conservation Innovation Grant for 2015-16 to work with growers in the Lake Ontario watershed on improving soil health. This project included sampling for Cornell Soil Health Assessments in vegetable fields, and providing growers with interpretation of the results.

The CVP facilitated the organization of two Grower Soil Health Discussion Groups. A Western NY group of about 30 farmers met three times in 2013 - 2014. They have since formed the Western NY Soil Health Alliance, a Farmer-to-Farmer Network, and have hosted several events. For information on the Alliance go to: <a href="http://www.wnysoilhealth.com/">http://www.wnysoilhealth.com/</a> or email: <a href="wnysoilhealth@gmail.com">wnysoilhealth@gmail.com</a>. A Finger Lakes group, with 15-20 growers has met on farms three times over the past year and a half. These groups have resulted in significant grower-to-grower sharing and learning about cover crops, crop rotations, reduced tillage, equipment and fertilizers. Growers interested in improving their soil health are encouraged to join them!

One of the best soil health resources is **Building Soils for Better Crops, 3<sup>rd</sup> edition** at: <a href="http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd">http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd</a>
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#### **Cornell Soil Health Assessments**

Thirty fields were sampled, and compaction was tested, on 15 farms in Niagara, Monroe, Genesee, Wayne, Ontario and Yates Counties. Worm counts were also done at the 10 soil sampling sites in each field. All farms grew vegetables, or vegetables and field crops. Most growers cover cropped at least some of their fields. Farms ranged from 130 acres to a few thousand acres. Eight growers used some or all reduced/zone or no till. Four farms used manure. Five of the 13 growers produce some or all of their crops organically.

Many of the growers' fields had several serious constraints to good soil functioning and crop growth. Some of the growers gave us their worst fields to test. There were a handful of fields where soils tested better, either on the biological tests, or on the soil aggregate stability test. These growers generally used intensive cover cropping, diverse crop rotations including soil building crops, and/or frequent manure applications, and some used reduced tillage. The growers with the best testing soils generally used at least two of these practices. A diverse crop rotation, including soil building crops, seemed to affect the test results the most.

The basic conclusion is that multiple good soil management practices must be adopted to begin improving soil health. Intensive row crop production reduces soil health. Many farms in the area have been under intensive vegetable production for decades. In addition, cover crop use had fallen out of favor. At the end of this effort, during personal consultations, all but one grower indicated that they were or would adopt more good soil management practices, either in terms of adding soil building crops to their rotation, increasing cover cropping of all kinds, and/or reducing tillage.

#### **Notes on Cover Crops**

Fourteen of the cooperating growers planted a wide range of cover crops. Rye, wheat, ryegrass and red clover were by far the most common. But growers also experimented with smaller acreages, including many different combinations, with other cover crops, including: oats, winter barley, sorghum sudangrass, triticale, Austrian winter pea, hairy vetch, Crimson clover, sunnhemp, Balsana fixation clover, soybeans, sweet clover, tillage radish, mustard, buckwheat, and sunflower.

Cover crops can be challenging in certain situations. Rye can get out of hand in a wet spring. Wheat isn't as much of a problem and is recommended. Be sure to kill grasses when they reach 6" tall to avoid nitrogen tie up, reduce inhibition of the

continued on next page

following cash crop, and reduce excess soil drying. A thick, killed cover crop sometimes keeps the soil from drying in a wet spring. Some growers are seeding half rates in the fall. Half rates or less are recommended when a grass is combined with a legume or crucifer. (If you participate in government cost sharing consult with your program contact before cutting seeding rates.)

Annual ryegrass can be difficult to kill if it isn't plowed down. Zone/no tillers are advised to experiment with it cautiously. Do not use VNS ryegrass as the mix of varieties ensures different times of spring growth. Consult with experienced growers who use it on all the steps they take to ensure success. Red clover is also difficult to kill if it isn't plowed down. This is a real problem for zone/no tillers. To chemically kill it 2,4-D or similar herbicide must be mixed with glyphosate to kill it. The waiting period for planting vegetables except sweet corn is nearly a month. Hairy vetch produces hard seeds which germinate in following crops. The seeds produced can't be separated from wheat at harvest. Avoid hairy vetch if you grow cash grains. If you grow a lot of legume cash crops use legume cover crops cautiously to avoid soil-borne disease problems.

For more information on cover crops go to: <a href="http://covercrops.cals.cornell.edu/index.php">http://covercrops.cals.cornell.edu/index.php</a> for details on all the options, plus the Cover Crop Decision Tool, for selecting the best crop for your soil management objective.

## Select Cornell Soil Health Assessment Results and Soil Management

Soil management practices in the 30 fields were summarized for the two years prior to sampling for the Cornell Soil Health Assessment. Table 1 relates soil management practices to two biological indicators of soil health: Active Carbon and Respiration. Results from 16 of the 30 fields are shown. Table 2 relates soil management practices to % Water-stable Soil Aggregates (for 16 of 30 fields). Farms with over-wintering cover crops, small grains, hay, and/or manure tended to be the six highest ranking fields in both tables. Only row crops were more common in the six lowest ranking fields. The tests below, plus checking for earthworms, are the most revealing of soil health, in my opinion.

Active Carbon (C) is a chemical measure of the quantity of carbon-containing residues in the soil that are readily available for microbial decomposition and nutrient release. Examples are live or recently dead plant materials, arthropods, microbes, etc. High Active Carbon indicates that there will be food for microbial activity for many weeks. Keep your fields green year round to feed soil organisms and build soil aggregation!

(Earthworms were noted at the 10 sampling sites (6"  $\times$  6"  $\times$  8") per field. The best testing soils, especially for Active Carbon, tended to have many earthworms, 3 to 20/hole. A good, quick way to check your soil health is to dig several holes 8" deep in the soil and count the earthworms. Do it at a time when there's good but not excess soil moisture. When soil dries out the worms move deep into the soil. Earthworms will only remain if there is fresh organic matter for them to feed on.)

Respiration (Resp) is the quantity of carbon dioxide (CO<sub>2</sub>) released over a 4 day incubation, which is an indicator of current microbial activity. Neither soil respiration, nor earthworm activity, will remain high without sufficient Active Carbon from regular additions of fresh organic matter, however. (Compost does not contain fresh organic matter as it is already quite highly decomposed.) High Respiration and low Active Carbon results could mean that the Active Carbon is nearly depleted.

% Water-stable Soil Aggregates (%Agg Stab) is the percent of soil aggregates which remain on a screen after a simulated hard 1" rain. Unstable soil aggregates dissolve and are washed away. In the field this results in soil erosion, plugged soil pores and/or crusting. Aggregate Stability is dependent on regular additions of fresh crop/cover crop residues. Microbial by-products of fresh residue decomposition include sticky polysaccharides and waxy glomulin, which, along with fungal hyphae and fine plant roots, stabilize soil aggregates. Thus the recommendation to keep your fields green 365 days a year is not only good for reducing erosion, but is also good for soil biological and physical health.

A Note on Compaction Testing – We measure compaction with a penetrometer (available on loan from some CCE and SWCD offices). Compaction of 300+ lbs/sq. in. (psi) prevents root growth. Testing should be done prior to spring tillage, when soil has good but not excess moisture. As soils dry out they become harder. You can't compare fields with different soil moisture. Also, a penetrometer can't measure the beneficial effect of root channels and earthworm holes on drainage and crop rooting.

Check out the **Cornell Soil Health home page** at: <a href="http://soilhealth.cals.cornell.edu/">http://soilhealth.cals.cornell.edu/</a>

Cornell Soil Health Tests are available as standard or complete packages, or you can order individual tests. Follow the directions for sampling, handling and shipping carefully to ensure the best result.

#### Fields That Tested the Best and the Poorest

Fields that tested the best and fields that tested the poorest, out of the 30 total, are shown below. The best are at the top of each chart, the poorest are at the bottom. The crop rotation is all row crops unless otherwise specified. Only two years of soil management history prior to sampling were collected. Previous management could be significantly affecting test results.

#### **Key to Soil Health Test Ratings**

Green = Good soil functioning

Yellow = Medium –sub-optimal soil functioning

Red = Low – Significant constraint to soil functioning

Table 1.

Soil Management Practices vs. Active Carbon and Respiration

Grower	Soil	Active C	Resp	Management	
6		531	0.37	mod till, 3 cover, 1 sm grain, manure	
4		509	0.49	ZT/till, 2 cover, 1 sm grain, manure	
4		468	0.54	ZT/till, 3 cover, 1 sm grain, manure	
3	fldcap	466	0.77	Till, 1 cover, 2 hay	
12	tilled	466	0.66	Till, 2 cover, had been idle	
5		466	0.71	ZT, manure	
14	sandy dry	452	0.40	Till, 1 small grain/cc	
4		460	0.56	ZT/till, 1 cover, 2 sm grain, manure	
9	sandy	341	0.25	Till, 2 covers, only veg	
1		340	0.48	ZT/till, 2 covers	
13		313	0.34	ZT/NT, 2 cover, 1 sm grain	
14	sandy dry	307	0.60	Till, 1 small grain/cc	
8	wet	301	0.29	Till	
15		254	0,40	ZT, 1 sm grain	
15		235	0.30	ZT, 1 sm grain	
1	sandy	176	0.41	ZT/till, 2 covers, only veg	

Table 2.
Soil Health Practices vs. % Water-stable Soil Aggregates

Grower	Soil	%Agg Stab	Management	
3	fldcap	39	Till, 1 cover, 2 hay	
14	sandy dry	38	Till, 1 small grain/cc	
12	tilled	38	Till, 2 cover, had been idle	
6		32	mod till, 1 cover, 2 hay	
10	tilled	31	Till, 1 fallow, 2 covers	
6		30	mod till, 3 cover, 1 sm grain, manure	
5		30	ZT, manure	
3	wet	29	Till, 1 cover, 1 hay, 1 idle	
7		12	ZT/till, 2 sm grain	
2		10	Till	
4		9	ZT/till, 3 covers, 2 sm grain, manure	
1	sandy	9	ZT/till, 2 covers, only veg	
1		8	ZT/till, 2 covers	
8	wet	6	Till	
4		6	ZT/till, 3 cover, 1 sm grain, manure	
15		5	ZT, 1 sm grain •	

### **Program Planning Underway for 2017 Empire State Producers Expo**

Darcy Telenko, CCE Cornell Vegetable Program

The 2017 Empire State Producers Expo will take place on January 17-19 at the OnCenter Convention Center in Syracuse, NY. This annual show combines the major fruit, flower, vegetable, and direct marketing associations of New York State in order to provide a comprehensive trade show and educational conference for New York producers, as well as neighboring states and Eastern Canada. In years past over 100 presentations were given by Cornell Cooperative Extension personnel and highly regarded speakers from across the country. Panel discussions feature some of the top industry experts and growers in New York. Between educational sessions, attendees can visit the trade show featuring over 150 commercial vendors and non-profit exhibitors.

Session organizers for the 2017 Empire Producers Expo are putting the finishing touches on the January program. The speakers and topics that have been submitted thus far for the educational program look to provide a cultivating few days. Topics include commodity specific programs in cabbage, processing vegetables, hops, grains, cut flowers, tree fruit, sweet corn, tomato, onion, potato, Cole crops, root crops and specialty crops; and focused programs in water manage-

ment and irrigation, weed management, soil health, post-harvest handling, biopesticides, beginning farmer, marketing using social media and apps, transplant and greenhouse production, climate and forecast models, labor, and hard cider production. DEC pesticide recertification credits and Certified Crop Advisor (CCA) credits will be offered during the appropriate educational sessions.

The New York Grown and Certified Program will be presented in a special session on January 18 and will feature the Commissioner of Agriculture, Richard Ball. Commissioner Ball will introduce the new standard for New York State agriculture and provide an opportunity for dialog about this new state-wide program.

We have made a few additions to this year's program by offering opportunities for intensive training during Expo in the form of specialized workshops. (Preregistration will be required to guarantee workshop material and/or spot in these programs.)

- 2017 Becker Forum: GAPs/Produce Safetey Alliance (PSA) Training
   The New York State Vegetable Growers Association in conjunction with the
   Produce Safety Alliance (a collaboration between Cornell University, FDA and
   USDA) are pleased to announce that one of the first producer trainings to meet
   the requirements of Food Safety Modernization Act (FSMA) will be offered dur ing the Becker Forum on January 16, 2017 in Liverpool, NY. This 7-hour training
   will provide the required training for farms to meet the Produce Safety Rule.
- Berry Grower Protected Culture Workshop on Tuesday, January 17.
- GAPs Day 2 Writing Your Own Food Safety Plan Workshop on Tuesday, January 17.

The complete Expo program will be mailed in early December. The program and online preregistration will also be available from the NYS Vegetable Growers Association at <a href="https://nysvga.org/expo/information/">https://nysvga.org/expo/information/</a> by mid-November.

Trade show exhibitor information can be found at: <a href="http://leetradeshows.com/empire-state-expo/">http://leetradeshows.com/empire-state-expo/</a> or Dan Wren at 800-218-5586, <a href="http://leetradeshows.com/empire-state-expo/">dwren@leepub.com</a>.

### **UPCOMING EVENTS** view all Cornell Vegetable

Program upcoming events at cvp.cce.cornell.edu

#### Cover Crop Field Demonstration Day

October 13, 2016 | 10:30 AM-2:00 PM Stanton's Feura Farm, 210 Onesquethaw Creek Rd, Feura Bush, NY 12067 (map it)



The Eastern NY Commercial Horticulture Program invites you to see over 20 different species and combinations of cover crops planted no-till directly into standing sweet corn! Guest speakers will discuss species selection, and our host farm will demonstrate their Unverferth Ripper Stripper unit and discuss their reduced tillage and cover crop experiences used for vegetables.

Guest Speakers: Dr. Paul Salon, Northeast Soil Health Specialist & Dave Wilson, Research Agronomist and Cover Crop Specialist

Registration fee: \$5.00 per person. Because lunch is being offered, preregistration is appreciated, but walk-ins are welcome to attend. To register visit <a href="http://enych.cce.cornell.edu/event.php?id=609">http://enych.cce.cornell.edu/event.php?id=609</a> or call Abby at 518-746-2553. For more information about the program, call Chuck Bornt at 518-859-6213.

#### Soil Health Field Day

October 26, 2016 | 9:00 AM - 3:30 PM Leicester and Mount Morris, NY





Featured: Grower speakers from NYS and Quebec, and a Penn State weed specialist. Field demonstrations of cover crop mixes, corn herbicide effects on interseeded cover crops, and roller-crimper/planter operation.

Cost \$15, at the door \$25. Contact SWCD Wyoming County at wcswcd@frontiernet.net or 585-786-3675. CCA and DEC pesticide credits pending.

#### Worker Protection Standard (WPS) Training

October 26, 2016 | Check-in 9:30 AM; Training 10:00 AM - 12:00 CCE Niagara County, 4487 Lake Avenue, Lockport, NY 14094

NYSDEC Pest Management staff will be providing outreach on the new Environmental Protection Agency (EPA) Worker Protection Standard (WPS), which goes into effect January 2, 2017. (Additional information about the WPS revisions can be found at <a href="https://www.epa.gov/pesticide-">https://www.epa.gov/pesticide-</a> worker-safety/revisions-worker-protection-standard.) The new WPS provides occupational protections from pesticide exposure for agricultural exposure. This training is for those who use or supervise the use of pesticides on farms.

To register, please send an email to PesticideCompliance@dec.ny.gov. If currently certified in New York as a pesticide applicator, include your Certification ID Number.

### Annual Cover Crop and Soil Health Workshop and Tour

November 4, 2016 | 9:30 AM registration Big Flats Community Building @ Town of Big Flats Municipal Campus

Indoor presentations from Cornell, Penn State, and USDA-NRCS begin at 10:00 before traveling to the Big Flats Plant Materials Center where attendees can tour cover crop demonstration plots. Cost: \$10 to cover lunch, exact change appreciated. For more info and to register, go to http://tinyurl.com/SoilHealthWorkshop-Tour or contact Paul Salon, paul.salon@ny.usda.gov or 607-562-8404, ext. 103.

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VEGEdge



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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