Cornell Cooperative Extension | Cornell Vegetable Program

VEGEdge

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Photo: Cheryl Bilinski, CCE Harvest NY

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Farmer Adaptations to Managing Weeds in Extreme Weather

Bryan Brown, New York State Integrated Pest Management, Sharon Bachman, CCE Erie County, and Antonio DiTommaso, Caroline Marschner, John Pirrung, and Megan Wittmeyer, Cornell University

Our research team recently conducted and compiled interviews with 21 New York field crop and large-acreage vegetable farmers about the impact of extreme weather on their weed control and what changes they have implemented in their management. Most of the farmers have continued to be reasonably successful with their weed management but many are starting to shift their approach.

Overly wet or dry periods can reduce herbicide efficacy in several ways. Pre-emergence herbicides with high solubility or low adsorption may be washed deeper than optimal in heavy rains or insufficiently activated in dry periods. Post-emergence herbicides often work best on healthy plants, but waterlogging or drought can stress weeds and minimize uptake or translocation. Furthermore, tillage and cultivation are best done in medium soil moisture conditions since wet soil would prevent tractor entry and dry, hard soil can limit tool penetration and create clods where weeds can survive. In addition to rainfall issues, one farmer mentioned missing the window to terminate rye because it was too windy.

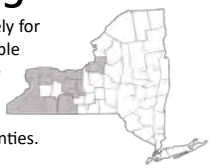
Farmers spoke of several ways they have “worked around the weather.” Having their own sprayer allowed one farm more flexibility in the timing of their applications. Others mentioned using maximum rates of pre-emergence herbicides, using products that require less rainfall to activate, or foregoing pre-emergence herbicides if weather conditions look unfavorable. One farm using both chemical and mechanical weed control has found that it allows for more flexibility based on the weather.

Soil management was also a factor. Some mentioned that having high soil organic matter is key to persevering through dry periods. Those who switched to no-till said it helps them avoid weather-related issues with tillage and cultivation, but their burndown herbicide applications are sometimes delayed. One participant is investing in more tile drainage to indirectly improve weed control through increased field access.

Most of the farmers were concerned about the potential for new weed species to move up from the southern US. Several expressed concern with Palmer amaranth, a weed originating from the desert southwest that is now established in five counties in New York and has demonstrated resistance to several herbicide classes.

continued on page 3

About VegEdge



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:
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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.

Contents

Our next issue of VegEdge newsletter will be produced on December 6, 2023.

Cucumber Grower Survey

Daniel Tregeagle and Alice Kilduff, North Carolina State University

Dear cucumber grower,

We are researchers from North Carolina State University, and we want to learn about cucumber growers' experiences with common cucumber diseases as well as growers' opinions about cucumber plant characteristics. The aim of this study is to inform plant breeders, growers' associations, the USDA, and others about what matters to growers like you in choosing which varieties to grow.

We are contacting you to invite you to participate in our survey. We anticipate that this survey will take 30 minutes to complete.

Please click this link to take the survey.

If you would like to know more about our study, please contact Dr. Daniel Tregeagle at tregeagle@ncsu.edu or 919-515-6091.

Thank you very much for considering our request and we hope to hear from you soon.

continued from page 1

Looking to the future, many of the farmers were interested in trying different herbicides, especially pre-emergence products that are less impacted by weather. Many also intend to use living or dead cover crops, especially rye or mustard cover crops for weed suppression and soil moisture management. Relatedly, selecting herbicides that are compatible with cover crops in rotation was a concern. Two farmers expressed interest in terminating with a roller crimper rather than herbicides, possibly to make a more uniform weed suppressive mulch.

Several also were hopeful that new technologies would improve their management in the future, such as weed control based on camera-actuated sprayers, interrow mowers, flame, electricity, UV light, radiation, or biological control. But overall, more strategic use of herbicides and cover crops were the most mentioned tactics to deal with weeds in more extreme weather. ●

Off-Season is a Good Time for Catching Up on Farm Food Safety Videos

Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

Over the past three years, there has been a group effort to create plain and simple resources for growers to access on farm food safety cleaning and sanitizing. The project was a collaboration of University of Vermont, Cornell University, Michigan State University, and the National Farmers Union – Georgia. Since we were researching methods of cleaning, we thought a snappy name might make it easy to remember: SCRUB – Sanitizing and Cleaning Resources for yoUr Business. Ok, it's a bit of a stretch but it works. Many resources can be found on the UVM **SCRUB website** (**https://blog.uvm.edu/cwcallah/scrub-project-resources/**).

Training Videos

- Farm Vehicle Operation for Produce Safety
- Food Safety for Wash/Pack Facilities on the Farm (5-part video series)
- Introduction to Cleaning and Sanitizing for Produce Safety
- Power Washing Aerosolization, Considerations for Produce Safety
- Washing Machine Cleaning Tips (7 videos to choose from)

YouTube Short Videos

The latest feature from this site comes by way of a series of YouTube short videos. These are very informative and worth a look. Titles include:

- 4 Steps to Cleaning and Sanitizing
- What is an Appropriate Detergent for Farm Use?
- Safely Dispensing Sanitizers
- How to Use Sanitizers on a Produce Farm

Culture and Case Studies PDFs and Videos

- Building a Small-Scale Open Packshed on Leased Land at Flywheel Farm video
- Easy Breezy Three Season Packshed at Stout Oak Farm web page (see the video playlist)
- Expanding to Accommodate Business Growth at Jericho Settler's Farm video
- Farmer's Favorites: Shipping Containers and Their Use on Vegetable Farms web page
- Giving a Dairy Barn New Life at New Leaf Organics web page (video and PDF available)
- Last Resort Farm Not Stalled by Dairy Barn Conversion web page (video and PDF available)
- Mighty Clean and Comfortable – A New Wash and Pack Shed at Mighty Food Farm web page
- New Metal Building from Scratch at Hall Brook Farm web page (also see the video and 360 tour)
- Renovating an Old Dairy Barn to a Year Round Packshed at High Meadows Farm video
- Sharpening the Edges: Wash/Pack Efficiencies in a New Farm Building at Small Axe Farm web page (video and PDF available)
- The BarnHouse: Optimized for Modern Day Vegetable Farming at Footprint Farm web page (video and PDF available)
- Twilight Highlight Webinar's video
- Wheels Keep Things Rolling at Root 5 Farm web page (video and PDF available)

Other resources include information on Produce Safety Planning, Water, Hygienic and Sanitary Design, and Standard Operating Procedures (SOPs).

For more information on farm food safety practices, program audit training/questions, FSMA regulations, and wash/pack operation and design, please contact Robert Hadad, Cornell Vegetable Program, at rgh26@cornell.edu, 585-739-4065. ●

Efficacy of Conventional and OMRI-Listed Fungicides for Cercospora Leaf Spot Control in Table Beets (2023 Results)

Sarah Pethybridge, Sean Murphy and Pratibha Sharma, Cornell University, and Julie Kikkert, CCE Cornell Vegetable Program

Cercospora leaf spot (CLS), caused by the fungus, *Cercospora beticola,* is the major disease affecting foliage of table beet in NY. Symptoms of the disease begin as small necrotic lesions, circular to oval shape. The lesions have a gray center and tan to purple margins (Fig. 1). Severe disease results in defoliation. The maintenance of healthy foliage to the end of harvest is important for several reasons. Firstly, for processing crops, harvest is conducted through top-pulling machinery which requires strong foliage. For the fresh market, CLS reduces product quality if selling with intact leaves. Diseased foliage may also reduce root sizes and quality.

Figure 1. Symptoms of Cercospora leaf spot on table beet cv. Ruby Queen. *Photo: Sarah Pethybridge, Cornell*

Fungicides are often applied to reduce the spread of CLS and potential crop loss. The most used conventional products are Tilt (propiconazole, Fungicide Resistance Action Committee [FRAC] group 3) and Miravis Prime (pydiflumetofen + fludioxonil, FRAC 7 + 12). However, the development of fungicide resistance is one of the major concerns for the sustainability of disease control. Organic Materials Review Institute (OMRI)-listed products with moderate efficacy for CLS control according to our previous studies include: LifeGard (*Bacillus mycoides* isolate J; FRAC P 06) and Cueva (copper octanoate, FRAC M 01) + Double Nickel LC (*Bacillus amyloliquefaciens* strain D747; FRAC BM 02). Apart from being registered for use in organic table beet production, these products also have a place in conventional production for rotation of different FRAC groups and fungicide resistance management. The objective of this study was to evaluate the efficacy of selected fungicides and fungicide programs for CLS management in table beet, including some additional OMRI-listed products.

2023 Trial

This year we conducted a small plot replicated trial at Cornell AgriTech, Geneva. The trial was planted with cv. Ruby Queen on 31 May with 30 inches between single rows and standard Cornell recommendations for nutrient and weed management. The products included in the trial are listed in Table 1. The fungicide treatments and a nontreated control were arranged in a completely randomized block design with four replications, and plots were two 10-ft long rows (Table 2). Fungicides were applied four times at 62, 68, 78, and 83 Days After Planting (DAP). Fungicides were applied at 26.4 gallons/A (30 psi) with flat fan nozzles. The trial was inoculated with *C. beticola* the day after the first fungicide application.

Table 1. Products evaluated for Cercospora leaf spot control in table beet at Geneva, NY in 2023.

Products	Active Ingredient(s)	FRAC Group[1]	Product Rate (/A)	Company	Registration Status on Table Beet in NY
Tilt	Propiconazole	3	4 fl oz	Syngenta	Registered
Miravis Prime	Pydiflumetofen + fludioxonil	7 + 12	11.4 fl oz	Syngenta	Registered
Howler	*Pseudomonas chlororaphis* strain AFS009	BM02	1.25 and 2.5 lbs	AgBiome	Registered on table beet, but not for CLS
Theia	*Bacillus subtilis* strain AFS032321	BM02	1.5 lb	AgBiome	Pending
BF009-03	Proprietary	--	0.5 and 0.75 lbs	AgBiome	No
Champ 2F	Copper hydroxide	M1	2.66 pt	NuFarm	Registered

1 Fungicide Resistance Action Committee

Results

Conditions were conducive for CLS which resulted in high severity in nontreated plots (90.1%) by the end of the season (109 DAP). All treatments significantly reduced CLS severity compared to the nontreated plots (Table 2). The most efficacious treatments were Champ 2F and the rotation programs that included Miravis Prime. Substituting Tilt with Howler or Theia in the Miravis Prime rotation program had no significant effect on CLS control and were all highly effective. As single products, Theia and Howler provided moderate and equivalent CLS control, reducing final severity by 41.3% and 41.6%, respectively. The experimental product, BF009-03 also provided moderate CLS control, and interestingly, CLS severity was significantly higher in plots treated with the higher (0.75 lb/A) rate than those receiving 0.5 lb/A (Figure 2; Table 2).

continued on page 5

continued from page 4

Reduced CLS severity translated to a significant increase in the dry weight of foliage (Table 2). The dry weight of foliage was significantly increased by an average of 57.3% in plots receiving Miravis Prime →Howler 1.25 lb per A →Miravis Prime →Howler 1.25 lb per A, Miravis Prime →Tilt →Miravis Prime →Tilt, and Champ 2F, compared to the nontreated plots, and were not different between each other. Four applications of Champ 2F increased the dry weight of foliage by 43.3% compared to the nontreated plots. The dry weight of foliage in plots receiving Theia, Howler, BF009-03 (both rates) were not significantly different from the nontreated control plots and between each other. Treatment had no significant effect on root weight, root number and average root shoulder diameter (data not shown). The absence of an effect from the fungicides on root yield components is highly desirable for fitting into the processing table beet market, where root size is strictly regulated for placement in cans and jars.

Take-home messages were:

- Champ 2F provided effective control of CLS. Champ 2F is a multi-site mode of action copper and hence could be useful for rotation with site-specific mode of action fungicides for fungicide resistance management.
- Other OMRI-listed copper products may also have similar CLS control for use in organic table beet production. However, caution should be used if residue is not desirable for fresh market sales.
- Rotation of Miravis Prime with several other products of differing FRAC groups did not compromise disease control.
- The microbial biopesticides, Theia and Howler, provided moderate CLS control on their own.

For further information, please contact: Dr. Sarah Pethybridge (sjp277@cornell.edu).

Table 2. Effect of fungicides on Cercospora leaf spot severity (109 Days After Planting; DAP) and the dry weight of foliage (110 DAP) of table beet at Geneva, NY in 2023 at the end of the trial. The arrow symbol (→) represents separation of the products in time to form a program.

Treatment	Cercospora leaf spot severity (%)*	Dry weight of foliage (g/3.2-ft)*
Theia (applied four times)	52.9 bc	106.8 de
Miravis Prime →Theia →Miravis Prime →Theia	30.5 de	129.9 bcd
Howler 2.5 lb per A (applied four times)	52.6 bc	97.1 e
Miravis Prime →Howler 1.25 lb per A →Miravis Prime →Howler 1.25 lb per A	27.1 e	156.1 ab
Champ 2F (applied four times)	22.4 e	140.3 abc
BF009-03 0.5 lb per A (applied four times)	49.9 c	99.1 e
BF009-03 0.75 lb per A (applied four times)	67.2 b	114.0 cde
Miravis Prime →Tilt →Miravis Prime →Tilt	32.2 de	165.5 a
Nontreated	90.1 a	97.9 e
P =	*<0.001*	*<0.001*

* Means followed by the same letter within a column are not significantly different.

Figure 2. Comparisons of table beet foliar health in plots of four selected treatments within a small plot replicated trial conducted at Geneva, New York. *Photos: Sarah Pethybridge, Cornell*

Consider Advocating for Cornell Cooperative Extension State 224 Funding

Local county Cornell Cooperative Extension associations are working diligently to increase 224 funding at the state level. This is a key portion of finances that helps CCE operate at the local level while also participating in regional programs like the Cornell Vegetable Program. Reach out to your local office's Executive Director to learn more about this initiative and consider sending a letter of support to Governor Hochul.

Turner Named Director of Cornell Cooperative Extension

R. J. Anderson, Cornell Cooperative Extension

Andrew Turner '88, M.P.S. '93, has been appointed director of Cornell Cooperative Extension (CCE) and associate dean for the College of Agriculture and Life Sciences (CALS) and the College of Human Ecology (CHE).

Currently director of CCE's New York State 4-H program, Turner will begin a five-year term on December 1, 2023, taking the reins from Jenny Kao-Kniffin, a CALS associate professor in the School of Integrative Plant Science Horticulture Section who has been serving as interim director.

The October 24 announcement was made by Benjamin Houlton, the Ronald P. Lynch Dean of CALS, and Rachel Dunifon, the Rebecca Q. and James C. Morgan Dean of CHE.

"I am very excited for Andy's leadership and his diverse experience in CCE, from rural to urban and across the entire system," Houlton said. "He is highly knowledgeable and collaborative, epitomizing CALS' core values. Under Andy's leadership, I am confident that Cornell and CCE will continue to meet the needs of the agricultural community, with new innovations, translational research outcomes and co-created education programs."

Andrew Turner

As director, Turner will oversee development and deployment of a diverse portfolio and programs for CCE, which maintains a presence in every county in New York including the five boroughs of New York City. This portfolio includes food systems, natural resources, sustainable energy, 4-H youth development, nutrition, parent education and economic development work. He will also oversee the CCE administrative staff and program leaders at Cornell, reporting directly to the CALS and CHE deans.

"With a career spanning almost every level of CCE, Andy brings great expertise and vision to this role," Dunifon said. "His experience positions him well to capitalize on synergies while breaking down barriers, moving the system forward in innovative and collaborative ways. I am looking forward to working with Andy to improve the lives of New Yorkers in every corner of the state."

A third-generation extension professional, Turner has led NYS 4-H since 2014, providing program leadership, professional development and support for one of the largest and most diverse 4-H programs in the nation. Prior to that, he spent two years as CCE assistant director for field operations and communications.

In his role with NYS 4-H, Turner has been a statewide and national leader in the design and application of diversity, equity and inclusion efforts. From 2020-22 he served as the co-chair of the National 4-H Equity Design Team, a strategic planning process designed to build the institutional will and strategy to achieve a 4-H membership, volunteer and staff profile that reflects the broad diversity of the U.S. population. In 2016 he collaborated with CCE Diversity Specialist Eduardo Gonzalez Jr. to design and initiate the NYS 4-H Justice, Equity and Diversity cohort, a two-year professional development experience that has reached more than 50 CCE educators.

Before joining CCE senior leadership, Turner spent nearly 10 years as a 4-H educator and an environmental issues program leader with CCE Rockland County and went on to serve 14 years as the executive director in Greene and Columbia counties. As executive director, Turner helped launch CCE's Eastern New York Commercial Horticulture Program and its Capital Region Agriculture team. He also was instrumental in developing the CCE Greene Agroforestry Resource Center in Acra, New York.

Turner earned a B.S. and M.P.S. from CALS and a doctorate in executive leadership (Ed.D.) from St. John Fisher College. There, his doctoral dissertation explored disruptive innovation in cooperative extension, identifying the characteristics and attributes of extension leaders who were able to create and sustain high-impact, innovative programming efforts.

"I am incredibly fortunate to provide leadership for CCE at such an important time for the communities of New York state," Turner said. "CCE's mission of bringing research-based knowledge together with local wisdom and experience has never been more critical as we address climate change, build community resiliency, support positive youth development and rebuild the civic ties that bind our communities together."

Upcoming Events

Farm Asset Protection Strategies: Safeguarding Agricultural Legacies for Future Generations

November 30, 2023 (Thursday) | 10:00 am - 2:30 pm
CCE Genesee, 420 East Main St, Batavia, NY 14020

In these uncertain times, safeguarding valuable farm assets has become paramount to ensure our farming communities' continued success and sustainability. Nicole Tommell, Farm Business Management Specialist with the CCE CNY Dairy, Livestock, and Field Crops team, and Steve Hadcock of the Capital Area Agricultural and Horticultural Program will present farm management and estate planning topics at this event.

Topics included are:

- How can I use my current records to gauge how well my business is doing? Various suggestions will assist you in looking at your records differently.
- What can I do to retain employees? Ideas will be shared on how to get new employees off to a good start. Also, ideas on how to help retain employees as well.
- Am I ready to consider diversifying my business? Thoughts on how to approach evaluating the diversification of your farm business will be shared.
- When and how do I start the succession process? It is never too early to begin discussing farm succession/transfer. Topics will be covered to help you feel confident to begin the process for your business. Shared topics may help you with your process if you have already started.

Each participant will receive written materials and a flash drive containing various resources.

COST and REGISTRATION: $10, includes lunch. Register online at NWNYTEAM.CCE.CORNELL.EDU

2023 Potato Advisory Meeting

December 12, 2023 (Tuesday) | 10:00 am - 3:00 pm
CCE Ontario, 480 N Main St, Canandaigua, NY 14424

This year's Potato Advisory Meeting will include talks from Cornell faculty on insect pest and weed updates, as well as updates from this year's potato variety trials. Following lunch, there will be a round table discussion with fellow potato growers and industry members. DEC credits: 2.0 credits in 10, 1a, 23.

COST and REGISTRATION: $10 per person, includes lunch. **Register online** by Friday, December 8 online at CVP.CCE.CORNELL.EDU so that we can make lunch arrangements. For more information, contact Margie Lund, mel296@cornell.edu, 607-377-9109.

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Cornell Vegetable Program

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