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Farming Full Steam Forward Amid COVID-19 Environment

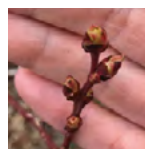
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Farming Full Steam Forward Amid COVID-19 Environment

Judson Reid and Lindsey Pashow, Cornell Cooperative Extension

The rapid series of changes in how we live and conduct business during the COVID-19 outbreak has created confusion for some on the role of ag businesses such as farms, farmer's markets, produce auctions, greenhouses and processing facilities. Based on a number of directives from the state it is clear that agriculture is viewed as essential to the well-being of New Yorkers. However, there are important modifications to be taken during this period.

On March 22, all non-essential businesses were ordered by New York State to decrease 100% of in-person staffing. However, Executive Order 202.6 allows "Essential Businesses" to remain in operation through this time. Produce auctions, farmer's markets and ag support businesses are considered essential and to remain open.

CONDENSED LISTING OF ESSENTIAL BUSINESSES OF EXECUTIVE ORDER 202.6

1. **Essential Health Care Operations**
2. **Essential Infrastructure**
3. **Essential Manufacturing**, including: *food processing, manufacturing agents, including all foods and beverages agriculture/farms*
4. **Essential Retail**, including: *grocery stores including all food and beverage stores, farmer's markets*
5. **Essential Services**, including: *warehouse/distribution and fulfillment*
6. **News Media**
7. **Financial Institutions**

8. **Providers of Basic Necessities to Economically Disadvantaged Populations**, including: *food banks*
9. **Construction**
10. **Defense**
11. **Essential Services Necessary to Maintain the Safety, Sanitation and Essential Operations of Residences or Other Essential Businesses**
12. **Vendors that Provide Essential Services or Products, Including Logistics and Technology Support, Child Care and Services**

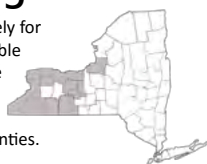
HORTICULTURAL ACTIVITIES CONSISTENT WITH EXECUTIVE ORDER 202.6

On March 24, the NYS Department of Agriculture and Markets included horticultural activities as consistent with Executive Order 202.6 (essential business). However, on March 31, this guidance was declared no longer applicable, and horticulture was designated as non-essential. **NOTE: greenhouses and nurseries that sell food producing plants are**

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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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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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CCE and its employees assume no liability for the effectiveness or results of any chemicals for pesticide usage. No endorsement of products or companies is made or implied. READ THE LABEL BEFORE APPLYING ANY PESTICIDE.

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 14224.



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This next issue of VegEdge newsletter will be produced on April 15, 2020.

Wholesale Produce Marketing Decision Survey

Earn a \$20 Amazon gift card for taking this 20-minute survey and make your voice known on what factors influence you to sell or not sell to a wholesaler.

Cornell researchers from the Dyson School of Applied and Economics and Management are conducting a study on wholesale contracts including specific requirements for sizing, packaging and delivery, and impact of new FSMA requirements and potential impact of increased minimum wage.

Project is geared towards large-scale producers, but producers of all sizes are of interest.

Take the survey now: http://bit.ly/survey_wholesale

Contact Rebecca Wasserman Olin (rdw224@cornell.edu) or Dr. Miguel Gomez (mig7@cornell.edu) with questions or comments. ●

considered essential, and therefore allowed to continue operating. All horticulture businesses can keep current stock alive as an allowance for non-essential businesses to perform maintenance and infrastructure work. It is noted that further guidance is likely, so please check in with us for updates.

GUIDANCE FOR THE OPERATION OF FARMERS' MARKETS

On March 31, an Interim Guidance for the Operation of Farmers' Markets was issued by NYS Department of Agriculture and Markets. It is important that all farmers' markets meet the following requirements for the duration of Executive Order 202.8, known as NYS on Pause, that prohibits, among others, mass gatherings.

The requirements of Farmer's Markets are:

- No forms of entertainment.
- No cooking demonstrations or sampling.
- No craft or non-food vendors, except for soap or hand sanitizer.
- Space out vendors as much as possible.
- Minimize amount of food on display with customer access.
- Increase the number of handwashing stations and make hand sanitizer available.
- Manage customer traffic within the market to eliminate congregating and to promote social distancing (i.e. maintaining a distance of at least 6 feet between customers).

Farmers and vendors at these markets are required to adhere to the following requirements:

- Do not permit customers to spend an excessive amount of time near the booth or table.
- Frequently clean and sanitize surfaces and other frequently touched points of contact.
- Frequently wash hands with soap and water or use hand sanitizer, if soap and water are not available. (Gloves are recommended while handling products at the market. See guidelines on How to Remove Gloves, pg 5.)
- Pre-package raw agricultural products, such as apple, potatoes, onions, etc. to the extent possible. All other foods, such as breads and baked goods, must be sold pre-packaged. Please refer to existing [food labeling laws](#).
- Be knowledgeable about the [Food Safety at Farmers Markets Guidelines](#).
- Frequently check the [Department's website](#) for updates and additional resources.

To quote directly from the NYS Dept of Ag and Markets website (3/31/2020):

"New York State has not restricted food producing farms, farmers' markets, grocery stores, retail food stores, food pantries, food banks, and food and beverage manufacturing facilities from being open. These operations are exempt under the mass gatherings guidance as essential food supply chain industries.

- *Food producing farms, fisheries, operations that care for animals, farmers' markets, food and beverage manufacturers/processors, grocery stores, retail food stores, food pantries, food banks, gas stations, and convenience stores are exempt from the state's guidance for workforce reduction.*
- *Businesses and vendors supplying goods and services to these essential industries, such as agri-businesses and operations supporting animal health, are also exempt.*

These businesses are exempt because they are essential food supply chain and related industries. They can continue to operate with their full workforce."

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Cornell Cooperative Extension Cornell Vegetable Program

We're Still Available to Help You!

As spring begins, the CCE Cornell Vegetable Program looks forward to working with the growers and industry members throughout our 14-county program area to continue to produce and market safe and healthful food for the community.

All of our staff are working remotely during this time, but you may still contact us by email and cell phones. We are working within the National and State guidelines for good social distancing and hygiene during the COVID-19 pandemic. We will provide updates on important topics through our regular channels.

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fresh market vegetables, weed management, and soil health

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Thanks to our farms and allied businesses for keeping food on our tables.
Stay well!

FOOD FACILITY COVID-19 STRATEGY CHECKLIST

These official designations recognize the critical role agriculture plays in human well-being. Although we are encouraged to 'farm-on', all of the essential agriculture businesses must implement measures to prevent the spread of COVID-19. The Institute for Food Safety at Cornell University provides the following guidelines, consistent with the NYS Department of Health. These are divided into technical, organizational and personnel measures. Management of produce auctions, farmer's markets, farm stands, CSA's, etc. can use this checklist to achieve compliance.

Technical Measures

- ☐ Install hand sanitizer dispensers, particularly at entrances, exits and transition areas
- ☐ Verify the virucidal effects of hand sanitizers
- ☐ Assess supply of gloves and other personal protective equipment (PPE), encourage their judicious use, and re-order supplies ASAP (without over-ordering)
- ☐ Assess supply of cleaning supplies, sanitizers, and disinfectants, encourage their judicious use, and re-order supplies asap (without over-ordering)
- ☐ Post informational signage directing risk-minimizing behavior for employees
 - Examples:
 - ☐ [Hand-washing procedures](#) (regularly, for 20 seconds with soap and water)
 - ☐ [Glove usage](#) (remove without contaminating hands, dispose, and wash hands)
 - ☐ [Cleaning and Disinfecting Facilities](#) - example guidance from the NYS Dept. of Health and Dept. of Agriculture & Markets Guidance
 - ☐ [COVID-19 Symptoms](#) (fever, cough, difficult respiration) and [how to stop the spread](#) (social distancing, handwashing, stay home when sick)
- ☐ Identify [high-risk locations/surfaces](#) (such as restrooms, counters, door knobs) and develop a Standard Operating Procedure to assure that these locations are routinely clean and sanitized (with enhanced frequency)

Organizational Measures

- ☐ Appoint a COVID-19 point person within the organization to handle communication and coordination
- ☐ Hold initial staff meetings on COVID-19 control strategies (obey social distancing during these meetings, train in small groups and maintain a distance of > 6ft between people) and regularly update and remind staff on COVID-19 control strategies. Use the meetings to enforce and communicate
- ☐ A proactive sick leave policy
- ☐ A method for confidential reporting personal illness and close contact with individuals that test positive for COVID-19
- ☐ Prohibit non-essential visitors and outside contractors
- ☐ Prohibit interaction with truck drivers and limit their movement in the facility
- ☐ Identify supplies that may be jeopardized in the current supply chain and plan allocation accordingly
- ☐ Develop an SOP that details actions to be taken if an employee is tested for COVID-19 and/or tests positive for COVID-19; See an [example SOP](https://dairyextension.foodscience.cornell.edu/sites/dairyextension.foodscience.cornell.edu/files/shared/SOP%20Actions%20when%20Worker%20tests%20positive%20for%20CoVID-19%20Version%201.pdf): <https://dairyextension.foodscience.cornell.edu/sites/dairyextension.foodscience.cornell.edu/files/shared/SOP Actions when Worker tests positive for CoVID-19 Version 1.pdf>

Personnel Measures

- ☐ Develop and use protocol for employee screening recent travel and health history. See an [example of a screening sheet](#) that could be used.
- ☐ Instruct staff to practice [social distancing](#)
 - ☐ Maintain at least 6 feet of distance between each other whenever possible
 - ☐ Avoid personal contact: shaking hands, etc.
- ☐ Refresh staff on proper hand hygiene and glove practices including [handwashing](#) and refraining from touching your face
- ☐ Develop and use protocol for respiratory hygiene (cover your cough and sneeze, wash your hands and dispose of tissues). See [example guidance on respiratory hygiene/cough etiquette](#).
- ☐ Promote protective behavioral measures such as avoiding touch of doorknobs by hand, etc.
- ☐ Reset break and meeting rooms seating to promote physical distancing

Check the [Institute for Food Safety at Cornell University](#) website to be sure that you have the latest version of the [Food Facility COVID-19 Strategy Checklist](#).
Updated on March 23, 2020.

If any ag business needs help accessing or printing online signage documents,
please reach out to Judson Reid, CCE Cornell Vegetable Program, at 585-313-8912. We are only a phone call away! ●

COVID-19 Resources for Farms

Here are some fact-based resources on Coronavirus (COVID-19). Again, representatives from the CCE Cornell Vegetable Program will print these out for those without internet access.

Institute of Food Safety Cornell
<https://instituteforfoodsafety.cornell.edu/resources/coronavirus-covid-19/>

New York State Department of Health Interim Guidance for Cleaning and Disinfection of Public and Private Facilities for COVID -19
http://www.health.ny.gov/diseases/communicable/coronavirus/docs/cleaning_guidance_general_building.pdf

Cornell Agricultural Workforce Development for farmers and their employees

- Guidance for Respirator Fit Testing from NYCAMH
- COVID-19 and Your Produce Farm Webinar (see next column on this page for details)
- H2A Updates
<http://agworkforce.cals.cornell.edu/>

COVID-19 and Your Produce Farm Webinar

Steps that produce farm managers and individuals working with fruit and vegetable farms should consider to protect their workforce, their business, and their markets

FRIDAY, APRIL 3, 2020 | 10:00-11:30 AM

- why prevention of the coronavirus/COVID-19 is important
- steps that employers should take to protect employees
- how to manage cleaning and disinfection in the workplace and employee housing
- state and federal sick leave and workforce reduction policies
- contingency planning to manage and prevent the spread of COVID-19 on-farm

This webinar will be led by Richard Stup, Cornell Agricultural Workforce Development, Elizabeth Bihn, Cornell Produce Safety Alliance, and Anu Rangarajan, Cornell Small Farms Program.

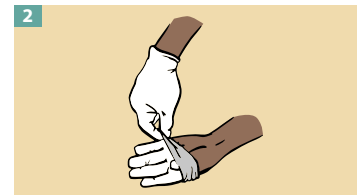
[Click here to REGISTER for the webinar](#)

How to Remove Gloves

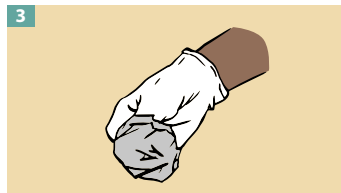
To protect yourself, use the following steps to take off gloves



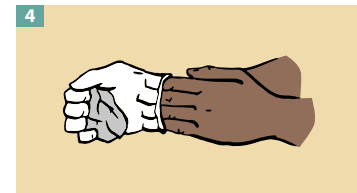
Grasp the outside of one glove at the wrist.
Do not touch your bare skin.



Peel the glove away from your body,
pulling it inside out.



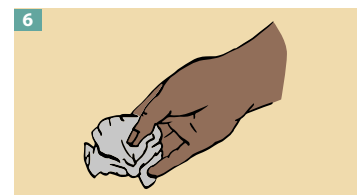
Hold the glove you just removed in
your gloved hand.



Peel off the second glove by putting your fingers
inside the glove at the top of your wrist.



Turn the second glove inside out while pulling
it away from your body, leaving the first glove
inside the second.



Dispose of the gloves safely. Do not reuse the gloves.



Clean your hands immediately after removing gloves.

Thinking Proactively About Potato Seedborne Pathogens and Seed Piece Treatments

Margie Lund, Cornell Cooperative Extension, Cornell Vegetable Program

Potatoes are susceptible to a wide range of diseases, many of which can negatively impact stand establishment and early season plant growth through infection of potato seed. While potato seed can become infected by soilborne diseases at planting, seed quality is the most important factor in reducing diseases early in the season. Therefore, only plant certified disease-free seed, and inspect seed prior to planting for signs of disease. Cut seed should also be properly suberized prior to planting. Potato seed should be warmed to 50°F before handling or cutting, and all cutting equipment should be properly sanitized. Proper suberization of seed pieces helps reduce infection after planting. Soil conditions at planting are also important for plant health, and planting seed in warm, well-drained soil that has been lightly cultivated can help speed up plant growth and lead to better stand emergence. While seed quality is the most important factor for reducing diseased seed and poor stand emergence, soilborne pathogens can also infect seed pieces soon after planting. Therefore, a good knowledge of your field history and past disease problems can be useful in creating a plan for proper prevention.

While all of the previous steps should be taken to help ensure you will see a healthy potato stand, seed piece treatments are also available for many seedborne pathogens (reference table below for available pesticide options). Treatments should be considered for stored seed when some potatoes show disease symptoms, and when planted in fields with a history of poor stand emergence or disease problems. Any diseased seed potatoes should be discarded prior to planting.

Treatments for Seed Pieces Before and At Planting

*Restricted-use pesticide; PHI=Pre-Harvest Interval; REI=Restricted-Entry Interval; Long Island (LI) use: Y=Yes, N=No

Product Name (Active Ingredient)	Product Rate	PHI (days)	REI (Hrs)	LI use	Labeled Use
Blocker 4F (PCNB) Group 14	5-10 pts/A, 5.2-10.4 fl oz/1000 row feet	-	12	Y	Rhizoctonia
CruiserMaxx Potato (<i>thiamethoxam</i> + <i>fludioxonil</i>) Group 12+	0.19-0.27 oz/cwt seed	-	12	N	Fusarium, Rhizoctonia, and Helminthosporium solani
Curzate 60 DF (<i>cymoxanil</i>) Group 27	0.25 oz/cwt	14	12	Y	Tuber-borne late blight *must be used with other fungicides registered as seed piece treatments
*Dithane DF Rainshield (<i>mancozeb</i>) or OLP Group M3	1.25 lb/50 gal	3	24	Y	Fusarium seed piece decay
*Elatus (<i>benzovindiflupyr</i>) Group 7	0.34-0.5 oz/1000 row feet	14	12	Y	Rhizoctonia canker, silver scurf, black dot
Emesto Silver (<i>penflufen</i> + <i>prothioconazole</i>) Group 7+3	0.31 fl oz/cwt	-	12	Y	Rhizoctonia black scurf, silver scurf, Fusarium seed piece rot
Headline SC (<i>pyraclostrobin</i>) Group 11	0.4-0.8 fl oz/1000 row feet	3	12	Y	Rhizoctonia
Maxim MZ (<i>mancozeb</i> + <i>fludioxonil</i>) Group M3+12	0.5 lb/cwt	-	24	Y	Rhizoctonia black scurf, silver scurf, black dot, Fusarium, seed piece late blight
Moncoat MZ (<i>mancozeb</i> + <i>flutolanil</i>) Group M3+7	0.75-1 lb/cwt	-	24	Y	Rhizoctonia, Fusarium dry rot, seed piece late blight
Moncot (<i>flutolanil</i>) Group 7	0.71-1.1 lb/acre	-	12	N	Rhizoctonia stem canker, black scurf, suppression of powdery scab
Potato Seed Treater 6% (<i>mancozeb</i>) or OLP Group M3	1-1 1/3 lb/cwt	-	24	Y	Fusarium seed piece decay
Quadris F (<i>azoxystrobin</i>) or OLP Group 11	0.4-0.8 fl oz/1000 row feet	14	4	Y	Rhizoctonia, silver scurf, black dot
Quadris Ridomil Gold SL (<i>mefenoxam</i>) Group 4	0.82 fl oz/1000 row feet	-	0	Y	Rhizoctonia canker, black dot, Pythium root rot, pink rot, leak
*Reason 500SC (<i>fenamidone</i>) Group 11	0.15 fl oz/cwt	14	12	N	Seed piece late blight
RootShield PLUS+ WP (<i>Trichoderma harzianum</i> Rifai T-22 + <i>Trichoderma virens</i> str G-41) Group NC+NC	0.03-3 lb/cwt	0	4	Y	Rhizoctonia black scurf and stem canker
Serenade ASO (<i>Bacillus subtilis</i> str QST 713) Group 44	2-4 qt/acre	0	4	Y	Rhizoctonia, Pythium, Fusarium, Verticillium, Phytophthora *approved for organic use
Vibrance Ultra Potato (<i>difenoconazole</i> + <i>mandipropamid</i> + <i>sedaxane</i>) Group 3+40+7	0.5 fl oz/cwt	-	-	Y	Fusarium seed piece rot, Rhizoctonia black scurf, silver scurf, suppression of pink rot and late blight ●

Statewide Herbicide Resistance Screening to Start in 2020: Help Us to Help You!

Lynn Sosnoskie, Bryan Brown, and Antonio DiTommaso, Cornell University

Weeds compete with crops for light, water, and nutrients, which can result in yield reductions. Weeds can also interfere with crop production by serving as alternate hosts for pests and pathogens, providing habitat for rodents, and impeding harvest operations. Consequently, growers employ a variety of control strategies, including the application of herbicides, to manage unwanted vegetation. Although herbicides can be extremely effective at controlling undesirable plants, failures can and do occur. Weeds may escape chemical treatments for many reasons including the evolution of herbicide resistance.

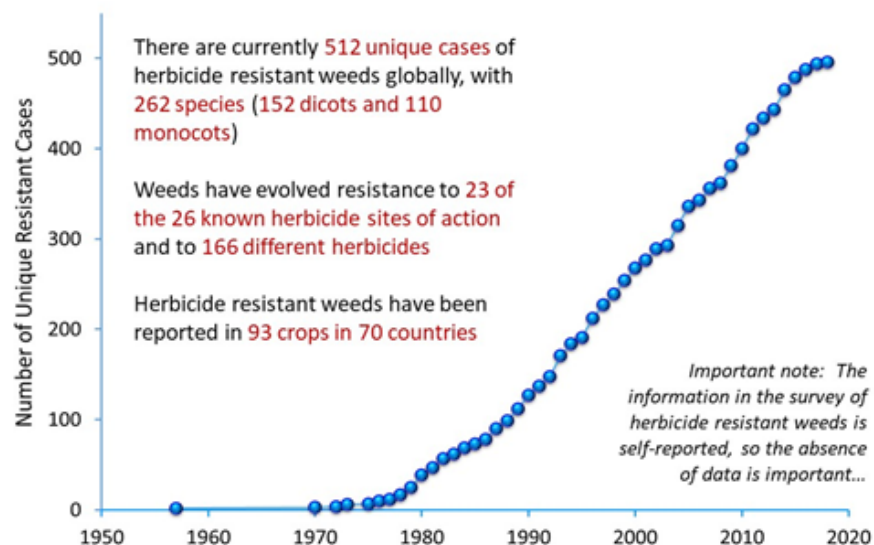
Worldwide, there are 512 confirmed cases (species x site of action) of herbicide resistance. With respect to the United States, 165 unique instances of resistance have been documented. In New York, there are only four formally reported occurrences; these include common lambsquarters (*Chenopodium album*), smooth pigweed (*Amaranthus hybridus*), common ragweed (*Ambrosia artemisiifolia*) and common groundsel (*Senecio vulgaris*). All were described as being insensitive to the photosystem II inhibitors (e.g. atrazine and simazine).

This, however, does not reflect the current on-the-ground situation in the state; work done by Drs. Julie Kikkert (CCE) and Robin Bellinder (Cornell) indicates resistance to linuron in some populations of Powell amaranth (*Amaranthus powelli*). Recent studies by Drs. Bryan Brown (NYS IPM) and Antonio DiTommaso (Cornell) suggest that horseweed (*Conyza canadensis*) and waterhemp (*Amaranthus tuberculatus*) populations may be resistant to one or more herbicide active ingredients. Pennsylvania has nine reported cases of herbicide resistance including glyphosate resistance in Palmer amaranth (*Amaranthus palmeri*), which was recently identified here in NY. While it is tempting to believe that herbicide resistance is a hallmark of agronomic cropping systems, resistance can and has developed in orchards, vineyards, vegetable crops, pastures, and along roadsides.

Beginning in 2020, we will undertake a screening effort to describe the distribution of herbicide resistance in the state. This coming summer and fall, growers, crop consultants and allied industry personnel who suspect they have herbicide resistance are encouraged to contact Dr. Lynn Sosnoskie (lms438@cornell.edu, 315-787-2231) to arrange for weed seed collection. Indicators of possible herbicide resistance include:

- Dead weeds intermixed with live plants of the same species.
- A weed patch that occurs in the same place and continues to expand, yearly.
- A field where many weed species are controlled but a previously susceptible species is not.
- Reduced weed control that cannot be explained by skips, nozzle clogs, weather events, herbicide rate or adjuvant selection, and calibration or application issues.

Growers can take several actions to stop the spread of herbicide resistant weeds and to prevent the development of new ones. First and foremost is scouting fields following herbicide applications and keeping careful records of herbicide performance to quickly identify weed control failure. Pesticide applicators should ensure that their equipment is properly calibrated and that they are applying effective herbicides at appropriate rates to manage the target species. Whenever possible, diversify herbicides to reduce chemical selection pressures that result from the repeated use of a single herbicide or site of action. If possible, incorporate physical and cultural weed control practices into a vegetation management plan. Be sure to control unwanted plants when they are small and never allow escapes to set seed. Clean equipment to prevent seeds of herbicide-resistant weed species from moving between infested and non-infested sites and harvest areas with suspected resistant populations, last.



Current status of herbicide resistance, globally, over time according to the International Survey of Herbicide Resistant Weeds (www.weedscience.org) ●



Western NY Berry Update

Esther Kibbe, Cornell Cooperative Extension, Harvest NY

STRAWBERRIES

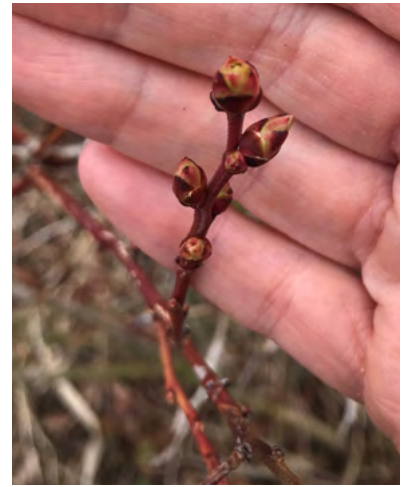
New leaves are starting to push under the straw. With no extended cold in the forecast, research has shown that it is better to remove straw early, if leaves are emerging, rather than basing on the calendar. Consider getting out there to rake it off soon. This is also the time to apply preemergent herbicides against annual weeds. Chateau or Devrinol can be used. Aim, Axex and Gramoxone are options as more weeds emerge, or against winter annuals, but should be applied with a shielded sprayer.



Strawberry leaves emerging from the crown.
Photo by E. Kibbe, CCE Harvest NY

BLUEBERRIES

Depending on microclimate, buds are just swelling to early green-tip. If you haven't already, this is the time to go after cane diseases (Phomopsis, Botrytis, Fusicoccum) with a delayed dormant spray of lime sulfur or copper. Several fungicides are also labeled for these, but I would save them unless you are dealing with a severe, recurring level of infection. As you are finishing up pruning, be sure to cut out any diseased canes and gall wasp galls. Start planning your spring herbicide applications. Blueberries have many herbicide options – the best choice depends on what your weed issues are.



Blueberry buds are between bud-swell and early green tip.
Photo by E. Kibbe, CCE Harvest NY

RASPBERRIES

Still looking pretty dormant. Copper or lime sulfur sprays can be applied for cane blights. This is a good time to get a head start on weed control. ●

Stand Uniformity

Ali Nafchi, Cornell Cooperative Extension

Both seed vigor and soil variability, especially changes in soil texture across a field play significant role in crop performance and the crop stand. Soil texture is a key factor in influencing soil moisture (soil's water-holding capacity), and changes in soil moisture influences soil temperature across a field. In addition, management practices during field preparation and planting can cause plant uneven stand. Seedbed preparation along with equipment settings can have a combined impact on stand uniformity. In precision seeding, a single seed is planted at an exact plant spacing to achieve a uniform stand. Precision planting and variable seeding rate (VSR) may have minimal impact on stand uniformity, but has important role on uniform maturity. Particular type of precision planter depend on the growers' preference, field conditions, equipment, and experiences are needed to address variabilities in a field. Managing optimum planting depth and using informed variable planting depth can improve the stand uniformity. Improper planting depth, soil compaction or seedbed sidewall compaction due to planting in wet soil conditions, and nutrient deficiencies can also reduce the stand uniformity. It is very difficult to isolate the exact cause of poor stand uniformity especially when the information related to soil conditions and management practices are not available. Adequate soil moisture, less compacted seedbed and addressing soil variability in our management practice, can provide a good growth environment leading to a uniform stand and uniformity of maturity. Tractor speed at planting is also a key for achieving uniformity. Lower speeds reduce injury to seeds (especially bean and pea) as they pass through the planter.

For more information:

[Seed Quality and Seeding Technology](#)

[Seed Vigor and Uniformity of Seedling Emergence in Soybean](#) ●

2020 Cabbage, Dry Bean and Processing Vegetable Crops Grants Awarded

Julie Kikkert, Cornell Cooperative Extension, Cornell Vegetable Program

The following projects were awarded by the respective industry funding programs for applied research and extension in 2020. Sincere thanks to the growers and processors who contributed to these funds and to those who served on the advisory committees/boards to review the project proposals.

Cabbage Research and Development Fund:

Researchers	Project Title	Award
C. Smart	Assessment of Copper Resistance and Role of TAL effectors in Disease in NY Populations of the Black Rot Pathogen	\$10,821
L. Sosnoski C. Hoepting	Optimizing Herbicide Weed Control and Crop Safety in Transplanted Cabbage	\$10,200
TOTAL AWARDS		\$21,021

Dry Bean Endowment:

Researchers	Project Title	Award
P. Griffiths	Breeding, evaluation and development of dry bean varieties that are highly adapted to NYS growing environments and markets	\$11,000
S. Reiners M. Rosato	Comparison of New and Standard Dry Bean Varieties at Cornell AgriTech	\$7,843
S. Pethybridge J. Kikkert M. Lund	Towards a Durable Management Strategy for White Mold in Dry Beans in New York (2020/21): Sclerotial Survival	\$7,000
A. Hamlin	Cool School Food: Encouraging the use of dry beans in school lunches, and promoting the health aspects of dry bean consumption	\$2,000
M. Lund M. Zuefle	Determine the magnitude and distribution of Western bean cutworm and the risk to dry beans, in the major production areas in New York	\$2,320
TOTAL AWARDS		\$30,163

The New York Vegetable Research Association and Council (Processing Vegetables):

Researchers	Project Title	Award
B. Nault	Evaluating Insecticide Programs for Corn Earworm in Sweet Corn Production Systems	\$21,205
S. Reiners M. Rosato	NYS Processing Green Pea Variety Evaluations	\$15,248
S. Reiners M. Rosato	NYS Processing Snap Bean Variety Evaluations	\$15,248
S. Reiners M. Rosato	NYS Processing Sweet Corn Variety Evaluations	\$15,248
L. Sosnoskie J. Kikkert	Weed Control in Processing Vegetables	\$31,484
S. Pethybridge J. Kikkert	Management of Table Beet Growth and Health Through Plant Growth Regulators	\$24,294
S. Pethybridge E. Branch J. Kikkert	Evaluation of Alternatives to Quadris for Early Season and Root Disease Control of Table Beet in New York: Year 2 (2020/21)	\$22,922
S. Pethybridge J. Kikkert	Manipulating Carrot Growth Through Plant Growth Regulators	\$9,924
TOTAL AWARDS		\$155,573 ●

Still Need DEC Recertification Credits? Get Them Online!

Dan Wixted, Pesticide Management Education Program (PMEP), Cornell University

Are you an applicator that is finding it hard to get the recertification credits you need because classes are being cancelled due to COVID-19? PMEP offers online recertification courses at <http://pmepcourses.cce.cornell.edu/>

Courses cost \$30 per NYS credit hour, as we have administrative costs associated with providing them. In addition to being approved by the DEC, many courses are also approved by the neighboring states of Vermont, Massachusetts, Connecticut, and Pennsylvania; this may be important to applicators in border counties who are certified in those states as well. ●

ToBRFV: A New Virus Mostly of Tomato to be Aware of

Margaret Tuttle McGrath, Plant Pathology & Plant-Microbe Biology Section, Cornell University

All growers with tomatoes need to know about Tomato brown rugose fruit virus (ToBRFV), a new tobamovirus. Import restrictions now in place are expected to decrease the risk. Federal Order effective since 22 November 2019 imposes restrictions on imports of tomato and pepper seed lots, transplants, and fruit from all countries where ToBRFV exists. Concern remains for seed imported beforehand in 2019 from these countries and seed from other countries. Some seed companies are testing all tomato and pepper seed for tobamoviruses.

FACTS ABOUT TOBRFV

- It is seed-borne. This most likely is how this virus has been moved globally. While virus could get on hands from handling infected fruit, likelihood is very low that someone is going to get ToBRFV on their hands by handling infected fruit purchased in a store and then handle tomato plants without having washed their hands. Furthermore, workers at tomato production greenhouses, where ToBRFV is of greatest concern, typically are required to wash hands when entering.
- The outer layer of the viral particle (the coat protein which protects the viral RNA inside) is tough and thus impervious to standard chemical treatments for viruses. An effective seed treatment has not been found yet, but research on this is on-going. Concern is that trisodium phosphate (TSP) itself may not be sufficient.
- Transmission is mechanical. This virus can be moved very easily by workers handling plants. Consequently, ToBRFV is expected to primarily be a problem in greenhouse tomato crops due to the frequency that plants are handled by workers. Tomatoes in high tunnels are at greater risk than those outdoors.
- It may be moved by pollinators in particular bumblebees.
- Tobamoviruses may be able to be spread in irrigation water.
- It overcomes all known genetic resistances in tomato to other tobamoviruses.
- Affected tomato plants could produce fruits with brown discoloration symptoms rendering them unmarketable.
- Pepper is also a natural host. Petunia, tobacco, European black nightshade, and several species of *Chenopodium* and *Chenopodiaceae* may also be hosts based on demonstrated susceptibility through artificial inoculation; however, while helpful, this procedure is notorious for identifying potential hosts that are never found naturally infected. Eggplant and potato were found to not be susceptible.
- In general, tobamovirus can remain infectious in infested plant debris, in soil, and on surfaces for more than 20 years, which may also be the case for ToBRFV. This degree of stability is unusual for viruses.



ToBRFV-infected tomato leaves on left and healthy leaves on right.

Photo: Kai-Shu Ling, USDA-ARS

SYMPTOMS

Yellowing, bubbling, mosaic and mottling, fern leaf and leaf narrowing are all symptoms of ToBRFV on leaves. Symptoms most commonly develop on upper leaves. Affected fruit may have rough surface; blotchy, pale, or yellow-brown spots; be undersized, deformed, and mature irregularly. Calyx veins can be brown and tips necrotic. Brown lesions also sometimes form on peduncles and pedicels. Flower abortion also occurs. Infected plants often are stunted. Symptoms of ToBRFV resemble those caused by related viruses including tobacco mosaic virus (TMV). Symptoms tend to be more severe during times of stress. Some varieties can remain symptom-free when infected. Photographs are posted at an [MSU webpage](#) and in brochure prepared by the [American Seed Trade Association](#).

KNOWN OCCURRENCES

ToBRFV was first described in Israel in 2014. Since then it has been confirmed in China, Germany, Greece, Italy, Jordan, Palestine, Saudi Arabia, and Turkey plus unconfirmed occurrences in Belgium, Chile, Ethiopia, the Netherlands, Peru, Sudan, Thailand, and United Kingdom. To date in the USA ToBRFV has been detected in imported tomatoes in Florida and California, in a tomato plant within a community garden in Florida, and in greenhouse tomato production greenhouses in California and Arizona in 2018 and in New Jersey in fall 2019. ToBRFV has been found in field crops but only in Mexico. It is now considered eradicated from the USA greenhouses where detected and from Germany.

continued on next page

MANAGEMENT

- Select seed that has been tested free from tobamoviruses, including ToBRFV.
- Require workers wash hands before handling tomato plants.
- Have workers wear disposable gloves and routinely disinfect them and tools while working. Disinfecting between each plant worked on is recommended for greenhouse crops. Ideal is for each worker to have 2 sets of tools so that one can be sitting in disinfectant solution while other is in use. ToBRFV can also be moved on clothing that rubs against plants. Disinfect shoes at least once daily.
- Disinfectants currently recommended for greenhouse tomato production against virus and viroid infection are 2% Virkon S, 10% Clorox (disadvantage – corrosive), Lysol (for hand sanitation) and 20% non fat dry milk (disadvantage – odor). See [on-line article](#) for more information. Research is underway to evaluate ability of other disinfectants to deactivate ToBRFV.
- Routinely disinfect equipment that rubs against plants, including greenhouse carts.
- Use UV to treat recirculated water in greenhouses.
- Regularly inspect plants for symptoms.
- Submit samples with suspect symptoms to a diagnostic laboratory equipped to detect ToBRFV. [Email Meg McGrath](#) to find out which laboratories currently can test. Agdia has an immunostrip for TMV that also detects ToBRFV and an immunostrip that detects all tobamoviruses, including ToBRFV. Either is useful as an initial screen. Agdia is developing an immunostrip specific for ToBRFV.
- Notify local extension specialist and/or NYS Department of Agriculture and Markets about confirmed occurrence in your crop.
- Carefully remove and destroy (bury or incinerate) plants confirmed to have ToBRFV plus adjacent plants. Discontinuing irrigation for a day beforehand will decrease risk of sap transfer.

Prepared March 2020 ●

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VegEdge is the highly regarded newsletter produced by the Cornell Vegetable Program. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell University 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 Vegetable Program**

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



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