



# VEGE<sub>edge</sub>

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Grow Beets, Not Weeds!

PAGE 1



Communications Assessment for Enrollees in the CCE Cornell Vegetable Program

PAGE 2



What are Some of the Issues Facing Farmers Markets?

PAGE 6



Plant Health Series: Variety Selection

PAGE 8

## Grow Beets, Not Weeds!

*Julie Kikkert, Cornell Cooperative Extension, Cornell Vegetable Program; with information from the late Dr. Robin Bellinder, Cornell University*

The market for table beets has increased in New York State due to interest in health benefits and locally grown foods. Additionally, new beet products and varieties have sustained the table beet renaissance. Weeds are a huge management issue in beets, because they can directly reduce yields through shading and competition, and increase the risk for plant pathogens by reducing air movement in a field and potentially harboring pathogens. Furthermore, weeds interfere with mechanical harvest as they can wrap around and jam up the equipment. As a last resort, the tops of tall weeds are mowed-off just above the beet canopy prior to harvest. However, weeds allowed to pollinate in the field, generally continue down the path of seed production, creating large weed seed banks in the soil. For instance a single lambsquarters or pigweed plant can produce over 70,000 seed, perpetuating the problem for years to come. Hand-weeding costs can be in excess of \$100/acre depending on the density of weeds in a field.

### A WEED MANAGEMENT PLAN FOR TABLE BEETS IN NEW YORK SHOULD INCLUDE:

- A whole farm plan where weed issues are managed in rotational crops and with weed suppressing cover crops in the years prior to planting beets.



Figure 1. As table beet seedlings emerge, so do weed seedlings such as purslane, velvetleaf, and lambsquarters seen in this photo. Often weed seedlings grow much faster than the beets. *Photo by Julie Kikkert, CCE Cornell Vegetable Program*

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:  
CCE Cornell Vegetable Program  
480 North Main Street, Canandaigua, NY 14224  
Email: [cce-cvp@cornell.edu](mailto:cce-cvp@cornell.edu)  
Web address: [cvp.cce.cornell.edu](http://cvp.cce.cornell.edu)

### Contributing Writers

Elizabeth Buck  
Robert Hadad  
Christy Hoepting  
Margie Lund  
Julie Kikkert  
Judson Reid

### Publishing Specialist/Distribution/Sponsors

Angela Ochterski

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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.

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**Help us serve you better by telling us what you think. Email us at [cce-cvp@cornell.edu](mailto:cce-cvp@cornell.edu) or write to us at Cornell Vegetable Program, 480 North Main Street, Canandaigua, NY 14224.**



# Contents

## Contact Us

Cornell Vegetable Program ..... 12

## Articles

Grow Beets, Not Weeds! ..... 01  
Communications Assessment for Enrollees in the CCE Cornell Veg Program .... 02  
What are Some of the Issues Facing Farmers Markets? ..... 06  
Survey on Trade-Offs Between Food Safety and Conservation Practices..... 07  
Plant Health Series: Variety Selection..... 08  
2020 Guidelines for Commercial Vegetable Production Now Available ..... 09  
Stokes Seeds Acquires Siegers Seed Company ..... 11

## Upcoming Events

Precision Agriculture Series ..... 05  
New York Certified Organic (NYCO) Meeting ..... 10  
2020 Upper Genesee Valley Produce Growers Meeting..... 10  
2020 Lake Erie Region Vegetable Meeting..... 10  
2020 NYS Dry Bean Meeting..... 10  
Raspberries 101 Workshop..... 11

*This next issue of VegEdge newsletter will be produced on March 2, 2020.*

## Communications Assessment for Enrollees in the CCE Cornell Vegetable Program

### CCE Cornell Vegetable Program



Thank you to all of our enrollees/subscribers that took the time to complete and return the CCE Cornell Vegetable Program: 2020 Industry Communication Preferences Assessment. We greatly appreciate your input!

If you have not done so yet, there's still time to send us your thoughts. Please mail in the Assessment that you received in January. (It was enclosed with our 2019 Year in Review brochure.) If you have misplaced the survey and would like another print copy of it mailed to you, contact Angela Ochterski at 585-394-3977 x426.

Or, [complete the Communications Assessment online](#). ●



- Stale seedbeds when appropriate
- Appropriate cultivation techniques, which may include tine-weeders, field cultivators, finger weeders, and other implements. Dr. Bryan Brown, [NYS IPM Program](#), is a good resource for cultivation equipment in table beets and conducted trials in 2018 and 2019 with stacking different implements on a toolbar to assess both weed control and crop damage.
- Pre-plant incorporated and/or Pre-emergence herbicides. Note the potential for crop injury with these products under certain environmental conditions.
- Post-emergence herbicides. There are no good stand-alone products, so combinations of SpinAid, Nortron, UpBeet and Stinger should be applied when beets and weeds are small depending on weed species present. Select Max or Poast herbicide can be applied for post-emergence grass control.

Further information on the available herbicides for 2020 is available in the text and table that follow. Make sure to read the labels for full details.

#### **DUAL MAGNUM (GROUP 15)<sup>1</sup>**

Dual Magnum is one of the most widely used pre-emergence herbicides in vegetable crops. It predominantly controls annual grasses but also some key broadleaf weeds as well, e.g. redroot pigweed, hairy galinsoga, and eastern black nightshade. Yellow nutsedge is also significantly suppressed. Under cold, rainy conditions beets can be stunted as they emerge and occasionally stands are reduced. Do not use on coarse textured soils with less than 1.5% organic matter or on soils with greater than 10% organic matter. Refer to the product label as well as the New York State Supplemental Labelling SLN NY-110004 at <http://www.dec.ny.gov/nyspad/>.

#### **RO-NEET HERBICIDE (GROUP 8)<sup>1</sup>**

Ro-Neet is a pre-emergent herbicide that is typically used pre-plant in beets in NY. The label also says that it can be applied at planting or immediately post-planting. It must be incorporated immediately to prevent loss of the herbicide. The new label states that crops should be planted or seeded immediately after application, except for fall application; whereas the old label recommended delayed planting. We do not have recent experience in Cornell trials with planting date of beets relative to Ro-Neet application. The previous recommendation for delayed planting may have to do with concern over crop injury. A colleague in Texas reports that he has not seen any crop injury in his trials. Furthermore, he says that weed control is generally very poor after about 3 weeks. Thus, waiting to plant may reduce the efficacy of the herbicide by as much as 30%. If you have used Ro-Neet in the past, you should proceed cautiously before changing the timing of your planting relative to herbicide application. Use 2.0 – 2.67 qt/acre for table beets. The lower rate should be used on sandy soils, in hot weather, or on dry soils. Annual broadleaf weeds will only be controlled if the application is made when conditions are favorable for germination. It will not control established or germinated weeds present at the time of application. Do not use on muck soils.

#### **NORTRON SC (GROUP 8)<sup>1</sup>**

While Nortron SC has a regular NYS label now, it is to be used in conjunction with New York State Supplemental labelling SLN NY-10014. This herbicide has both pre-emergence and post-emergence activity largely on annual broadleaf weeds, with some activity on foxtails and large crabgrass (see Table 1). Pre-emergence applications do not require incorporation as long as sufficient rainfall is predicted, and can have residual activity of 5 to 6 weeks. Cornell research tested 1.0 and 2.0 quart rates and generally injury was low and rapidly outgrown at the higher rate. Injury observed included some loss of stand, stunting, and occasional downward cupping of early leaves. Weed scientists in Oregon and Michigan have reported more significant injury with the 2.0 quart rate and frequently attribute this injury to soils having high amounts of sand. The label for New York lists 60 fl. oz (2.1 quart) for the pre-emergence rate. Do not use on muck soils.

Post-emergence applications are intended to be applied together with Spin-Aid, UpBeet, and Stinger. These 2 and 3 product mixtures are called ‘micro-rate’ applications. They are intended to be applied when the weeds are very tiny, cotyledon to 2 true leaves and are to be applied when the beets have 2, 4, and 6 leaves, roughly every 7 to 10 days. The rates for use in New York are 5.25 to 10.5 fl. oz depending on the size of the beets at the time of application. Also, specific to New York’s 24C is the restriction to making no more than 2 applications per acre per season. Thus, Nortron could be applied pre-emergence and followed by one post-emergence application later or it could be applied twice to emerged weeds with the other post-emergence herbicides. Adjuvants are not used in mixtures that include Spin-Aid as this product is an emulsifiable concentrate. If applied with UpBeet or Stinger, then adjuvants are recommended. See labels for specific details. The label does not list a PHI for this product.

#### **UPBEET HERBICIDE (GROUP 2)<sup>1</sup>**

UpBeet has only post-emergence activity and provides excellent control of several broadleaf weeds. This herbicide will be of interest to growers who have had problems with velvetleaf. Other weeds controlled include wild mustards, wild radish, and smartweeds. Like post-emergence Nortron, control of multiple weeds increases when UpBeet is applied together with the other post-emergence herbicides at the 2, 4, and 6 leaf stages. It is applied at 0.5 oz/A when weeds are tiny, cotyledon to 2 true leaves, and also requires adjuvants when applied with Nortron and/or Stinger but not with Spin-Aid. The PHI for this product is 30 days.

#### **SPIN-AID HERBICIDE (GROUP 5)<sup>1</sup>**

Spin-Aid is a key component of the ‘micro-rate’ application program mentioned above. The labeled rate ranges from 1.5 to 3 pints/A depending on the number of beet leaves present. Spin-Aid is one product that is more likely to cause slight injury, leaf chlorosis or tip burn after application, but most of the time, recovery occurs within a week or two. However, Spin-Aid can be very “hot” under higher rates as I have burned 2-leaf beets with 1.5 pints/A. Please use this product cautiously if you are not familiar with it. Weeds are

most successfully controlled when they are tiny, cotyledon to 2 true leaves. Spin-Aid is one of the only beet herbicides with significant activity against common lambsquarters. Some of the other well controlled weeds include: common chickweed, c. purslane, c. ragweed and annual sowthistle. This herbicide does not require the use of adjuvants. The PHI for beets is 60 days.

#### STINGER (GROUP 4)<sup>1</sup>

Stinger has a fairly narrow spectrum of weed species controlled and should only be used if those species are problematic in a given field (based on scouting). Stinger has primarily post-emergence weed control activity but does remain in the soil for an extended period of time and due to this has specific crop rotation restrictions. It is important to review these on the product label. Stinger is noted for excellent control of common ragweed, galinsoga, nightshade species, wild buckwheat, prickly lettuce and annual sowthistle. It also does a good job of suppressing Canada thistle and dandelion. Stinger may be applied twice per season, to beets having 2 to 8 leaves at rates of 0.25 to 0.5 pint/A with a total of 0.5 pint

being applied. The product label states that adjuvants are not required for applications of Stinger; however, they are sometimes used when mixed with Nortron and UpBeet. The PHI for Stinger is 30 days.

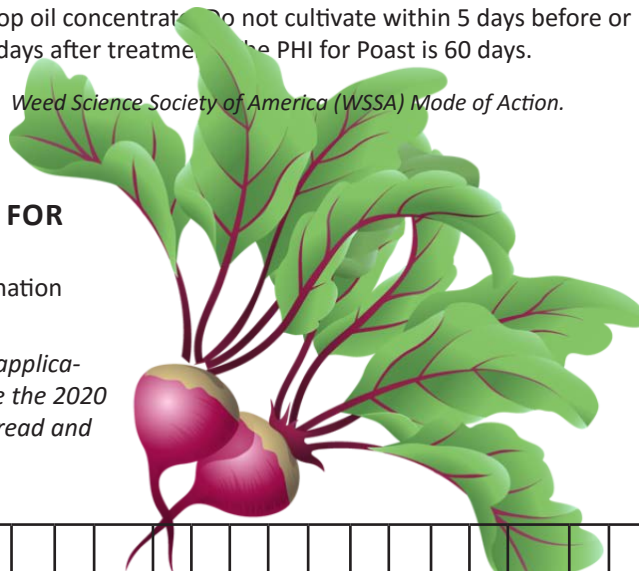
#### SELECT MAX (GROUP 1)<sup>1</sup>

A post-emergence herbicide with activity against many annual grass species. The use rate is 12 to 16 fl. oz, with no more than 0.5 lb a.i./A per season. NIS at 0.25% (v/v) is recommended. Do not cultivate within 7 days before or after application. The PHI for Select Max is 30 days.

#### POAST HERBICIDE (GROUP 1)<sup>1</sup>

A post-emergence herbicide with activity against many annual grass species. Apply to actively growing grasses according to the maximum grass sizes on the label. Do not exceed 2.5 pt per application or 5.0 pt/acre per season. Always add 2.0 pt/a crop oil concentrate. Do not cultivate within 5 days before or 7 days after treatment. The PHI for Poast is 60 days.

<sup>1</sup> Weed Science Society of America (WSSA) Mode of Action.



### RELATIVE EFFECTIVENESS OF HERBICIDES AVAILABLE FOR USE IN TABLE BEETS IN NEW YORK FOR 2020

Compiled by Julie Kikkert, CCE Cornell Vegetable Program with information from the late Robin Bellinder, Cornell University

*For general comparison only. Effectiveness may vary with method of application, rate, use of an adjuvant, size of weed, soil type and weather. See the 2020 Cornell Guidelines for Vegetable Production for more details. Always read and follow label directions.*

Key to Compare Effectiveness: G = Good; F = Fair; P = Poor to None

| Herbicide                        | Rate/Acre    | PHI  | Lambsquarters | Purslane | Common Ragweed | Pigweed | Smartweed | Galinsoga | Mustard | Nightshade     | Chickweed | Shepherds Purse | Velvetleaf | Wild buckwheat | Barnyardgrass | Crabgrass | Fall Panicum | Foxtail sp. | Quackgrass | Yellow Nutsedge | Canadian Thistle | Dandelion |
|----------------------------------|--------------|------|---------------|----------|----------------|---------|-----------|-----------|---------|----------------|-----------|-----------------|------------|----------------|---------------|-----------|--------------|-------------|------------|-----------------|------------------|-----------|
| <b>Pre-Plant Incorporated</b>    |              |      |               |          |                |         |           |           |         |                |           |                 |            |                |               |           |              |             |            |                 |                  |           |
| Ro-Neet (cycloate)               | 2.0-2.67 qt  |      | F-G           | F        | P              | G       | P         | F         | P       | F-G            | F         | G               | F          | F              | G             | G         | F            | G           | F          | F-G             | P                | P         |
| <b>Pre-Emergence</b>             |              |      |               |          |                |         |           |           |         |                |           |                 |            |                |               |           |              |             |            |                 |                  |           |
| Dual Magnum (s-metolachlor)      | 0.67 pt      |      | P             | F        | P              | G       | P         | G         | P       | G <sup>a</sup> | P         | P               | P          | F              | G             | G         | G            | G           | P          | G               | P                | P         |
| Nortron (ethofumesate)           | 60 fl oz     |      | F             | F        | P              | F       | G         | P         | G       | G              | G         | P               | P          | G              | P             | P         | P            | F           | P          | F               | P                | P         |
| <b>Post-Emergence</b>            |              |      |               |          |                |         |           |           |         |                |           |                 |            |                |               |           |              |             |            |                 |                  |           |
| Nortron (ethofumesate)           | 5.25-10.5 oz |      | F             | P        | P              | F       | G         | P         | G       | G              | F         | P               | P          | F              | P             | P         | P            | F           | P          | P               | P                | P         |
| UpBeet (triflurosulfuron-methyl) | 0.5 oz       | 30 d | P             | P        | F              | F       | F-G       | F         | G       | F              | F         | F               | G          | F              | P             | P         | P            | P           | P          | P               | P                | P         |
| Spin-Aid (phenmedipham)          | 1.5-3.0 pt   | 60 d | G             | G        | G              | P       | P         | P         | P       | P              | G         | G               | P          | P              | P             | P         | P            | P           | P          | P               | P                | P         |
| Stinger (clopyralid)             | 0.25-0.5 pt  | 30 d | P             | P        | G              | P       | G         | G         | P       | G              | P         | P               | P          | G              | P             | P         | P            | P           | P          | P               | F                | F         |
| Select Max (clethodim)           | 9-16 fl oz   | 30 d | P             | P        | P              | P       | P         | P         | P       | P              | P         | P               | P          | P              | G             | G         | G            | G           | F          | P               | P                | P         |
| Poast (sethoxydim)               | 0.5-2.5 pt   | 60 d | P             | P        | P              | P       | P         | P         | P       | P              | P         | P               | P          | P              | G             | F         | G            | G           | F          | P               | P                | P         |

<sup>a</sup> Eastern black nightshade only ●

**Cornell Cooperative Extension**

# Precision Agriculture Series

Learn what precision agriculture entails, the economics of using precision ag, and the preferred methodology and benefits. This free, 3-day event series will be presented by Dr. Ali Nafchi, Precision Ag Specialist of the CCE Cornell Vegetable Program and the CCE NWNV Dairy, Livestock, and Field Crops team. Topics for each day will be determined by the audience interests and questions. Pre-registration is required. See location listing for details.

## Introduction to Precision Agriculture

- Why should producers be interested in precision agriculture?
- Goals, key factors, information, technology, management

## Components of Precision Agriculture Equipment

- Key components, equipment, computer/controllers, sensors, GIS, GPS, remote sensing, satellite imagery, UAV's

## Agricultural management philosophy (PA perspective)

- What is zone management?
- Best management practices
- Soil and tillage management

## Soil electrical conductivity (EC) and ways to measure it

### Precision soil sampling vs. grid sampling

- Soil EC: Veris vs. EM38, EC vs. soil texture, and EC vs. yield map

### Site specific management/variable rate applications

- Variable depth tillage control, variable seeding rate, automatic section control, variable rate irrigation, and variable irrigation based on soil texture

## Map Principles

- Why is map-making important?
- Yield maps vs. prescription maps
- Importance of yield monitors, yield monitoring components, calibration and factors that effect on it

## Introduction to NDVI

- Characteristic of NDVI values
- NDVI estimation and photo analysis

## Economics of using precision agriculture Preferred methodology and benefits, evaluation

For more info about this series, contact Ali Nafchi at 585-313-6197.



### ERIE COUNTY

CCE Erie County, Dard Hunter Hall, 2nd floor  
21 S Grove St, East Aurora, NY 14052

Wednesday, February 19

Wednesday, March 4

Wednesday, March 25

1:00 - 3:00 PM

To register: 716-652-5400 x176

### GENESEE COUNTY

CCE Genesee County, Boyce Board Room  
20 E Main St, Batavia, NY 14020

Thursday, February 20

Friday, March 6

Friday, March 27

10:00 AM - 12:00 PM

To register: 585-343-3040 x138

### NIAGARA COUNTY

CCE Niagara County  
4487 Lake Ave, Lockport, NY 14094

Tuesday, February 4

Tuesday, February 18

Thursday, March 5

10:00 AM - 12:00 PM

To register: 716-433-8839

### SENECA COUNTY

Ovid Fire Hall  
2136 Brown St, Ovid, NY 14521

Friday, February 7

Tuesday, March 3

Friday, April 3

1:00 - 3:00 PM

[Register online](#) or call 315-539-9251

### STEBEN COUNTY

Steuben County Office Building Annex  
Conference Rooms A-B

20 East Morris St, Bath, NY 14810

Thursday, February 6

Thursday, March 26

Thursday, April 9

1:00 - 3:00 PM

To register: 607-664-2300

Photo credit: Lindsay France, Cornell-UREL





# What are Some of the Issues Facing Farmers Markets?

Robert Hadad, CCE  
Cornell Vegetable Program

The long-awaited consumer survey, [Assessing the Barriers to Increasing Customer Participation and Farm Sales at Farmers Markets: Implications for Marketing Strategy](#) by Todd Schmit, Roberta Severson, and Ekubo Sawaura all from the Dyson School of Applied Economics and Management, Cornell University, has been released. The survey was answered by 2856 people from 4 states (NY, VT, MA, and MD) with NY having 925 respondents. A summary of the findings and insights follows.

## SURVEY GOAL

The ultimate goal of the survey was to offer insights into why attendance and sales are dropping from farmers market. The hope was that the data would provide information for creating actions that would improve retention for current shoppers and pull in new shoppers. The survey report can be found at the [Farmers Market Federation of NY website](#) and also check out their upcoming webinar series.

## HIGHLIGHTS OF THE SURVEY

The authors asked a series of questions based on the experiences of people with shopping at farmers markets (FM) comparing 2017 to 2016. The answers given provided analysis based on the categories given by the respondents. The first group (B1) was made up of people whose purchases at farmers markets in 2016 to 2017 increased or stayed the same. The second group (B2) were people whose purchases decreased during that time period. Those who didn't shop at farmers markets were B3.

## DEMOGRAPHICS

- B1 - 30% of shoppers between ages 25-44. 30% between 44-59 and 38% over 60. The 18-24 age group shopped the least at around 2%.
- B2 and B3 shoppers more evenly distributed over the age ranges.
- Household size of 2 people made up 49% of shoppers while a household of 3 and 4 were about 16% and 12% respectively.

- Families with children under 5 made up only 8% of shoppers while families with children over 5 were at 15%.
- Whites made up about 90% of shoppers.
- Females were 83% of shoppers.
- Income groups: 18.6% of respondents making \$25-49,999. Nearly 36% were \$50-\$99,999. 37% over \$100,000.
- Fulltime or self-employed people made up 51%

## DATA ON SPENDING HABITS

- B1 and B2 groups, the percent of food dollars spent at grocery stores were between 47-54%.
- For FM, B1 spent 18.7% and B2 9%. Co-ops and CSAs were around 10% and 4.4% respectively.
- "Local food" was highly ranked (88%) as important reason to shop at FM followed by supporting local farmers and purchasing fresh produce.

## NEGATIVE PERCEPTIONS OF FARMERS MARKETS

Respondents listed an assortment of reasons on why they don't attend farmers markets more often and why they don't spend more money when there:

- Feel pressured to purchase if they visit each grower
- Intimidated to talk with growers – growers don't seem welcoming
- Prices are perceived as being too high
- Having enough cash at the market (need for ability to use credit card)
- Limited selection by variety
- Limited number of growers
- Poor signage. Signs should include a) price, b) what product is, and c) how to use product
- Want to see farmer not workers at booth/stall
- Convenience (as compared to stores)
- Too much of a flea market atmosphere
- FM seem elitist
- Due to price, healthy food a luxury
- Too much emphasis on social gathering, ready to eat foods, entertainment rather than easier shopping

*continued on next page*

- Inconvenient times of market open for working people
- Not open year round
- Poor parking
- Limited or non-existent public transportation

## DISCUSSION

The authors, in my opinion, didn't offer strong action points to deal with the initial survey goals. From reading the whole report, here are several action points that could be helpful for farmers market managers. Looking at the list of negatives above, responding to these would be a good place to start. Farmers need to know how to set prices and communicate with their customers more. Merchandizing is another area that sellers need to learn more about.

Knowing the demographics of the area surrounding the FM should be investigated. Looking at available transportation routes and the time of FM operation is also critical. EBT, SNAP and credit card sales offer customers more convenience.

The report didn't really look at the differences between a more suburban/urban FM and rural FM. The rural FM are seemingly having a more difficult time than the metro areas. The needs of these FM must be investigated. FM in the same metro area or in the same rural county should be working together to achieve improvement through collaboration rather than competition for the same growers or from lower pricing.

Management of FM is another area where this position simply just can't be a job of oversight. Understanding the financial situation of how farmers and vendors are succeeding (or failing) must be incorporated. If farmers aren't doing well at a market, the reasons might be market issues that the management can address. Too often, decisions about bringing in new vendors/farmers are not made with the financial interests of the current growers in mind. One example of this is making the market look fuller with more farmers. There is a balance between having enough farmers and having too much competition.

Advisory committees made up of vendors/farmers, the input from all the growers, the management staff, and a few customers could help achieve a strong working group where decisions can be made based on real needs and benefits rather than perceived notions. The results of the decisions must impact farmers in a positive profitable way.

One of the biggest issues that may be facing farmers markets is price. This is where management and the farmers can provide the message of the many benefits of the FM. Price of locally grown reflects the true cost of food production. Consumers need to understand this. The financial impacts of the farmers making a living wage has a strong positive effect on the local economy. ●

## New Survey to Shed Light on Trade-Offs Between Food Safety and Conservation Practices on Produce Farms in the Eastern United States

*Daniel Weller, University of Rochester; Patrick Baur, University of California; and Aaron Adalja, Cornell University*

Recent studies have suggested that on-farm food safety practices can have unexpected economic and ecological impacts. Despite the potential for negative consequences, limited data are available on the costs and benefits of implementing specific practices. Co-managing farms for food safety and sustainability is further complicated because farms are linked to adjacent environments so that management decisions can have unexpected ecological, economic and food safety consequences. A comprehensive understanding of the links between agricultural and adjacent environments is key to ensuring environmental health, sustainability, and food safety. A [new survey](#), funded by the Atkinson Center at Cornell University, promises to give a clearer picture of these linkages and what this means for growers.

Specifically, to meet this need, a new collaborative research project between researchers at Cornell University, the University of California, and the University of Rochester is reaching out to growers in the Eastern United States to fill out a survey on food safety. The survey asks for information on how monetary and labor costs associated with on-farm food safety, agricultural water use and treatment, pest management and conservation practices. The survey also provides an opportunity for participating farmers to report any obstacles or difficulties they have encountered. Filling out the survey should take about 20-30 minutes, and all responses are confidential.

The project will not only identify grower costs associated with various farm practices, the information generated will also be

integrated, using big data analytics, into models to quantify trade-offs between different grower aims including food safety, conservation and profit. This model will then be used to develop guidelines for how to best co-manage produce farms for these aims. The survey is a key part of this process, as it will clarify how costs vary among farms of different sizes, cropping systems/types, location, and organic certification status. The research will also shed light on how voluntary third-party audits, conservation incentives and other initiatives affect growers.

The results of this survey should point to opportunities for improving food safety and conservation on-farms while reducing costs for growers.

If you grow vegetables, fruits, or nuts in the Eastern United States and would like to participate in this effort, we encourage you to [TAKE THE SURVEY NOW](#). The person most directly in charge of managing food safety should take the survey. All responses are confidential and reported results will be fully anonymized.

The first 300 people to complete the survey will be eligible for a \$15 e-gift card. The survey will be open through May 31, 2020.

For further information, please contact the project directors, Dr. Daniel Weller ([Daniel.Weller@urmc.rochester.edu](mailto:Daniel.Weller@urmc.rochester.edu)), Aaron Adalja ([aaron.adalja@cornell.edu](mailto:aaron.adalja@cornell.edu)), or Patrick Baur ([pbaur@berkeley.edu](mailto:pbaur@berkeley.edu)). ●

# Plant Health Series: Variety Selection

Elizabeth Buck, Cornell Cooperative Extension, Cornell Vegetable Program

The UN has declared 2020 the International Year of Plant Health, and the USDA followed up by declaring a focus on plant-impacting invasive species. As a confirmed plant nerd, I found this quite exciting (Hooray!) If you also frequently find yourself thinking about how to keep crops happy and healthy, I'll be writing a series of articles outlining how you can participate in The Year of Plant Health. The first is about using seed source and variety selection to avoid plant disease challenges.

## SUMMARY

They tell me don't bury the lede, so here's your summary, right up front. Please do read beyond it, I did endeavor to put some useful detail into the article.

- Start with clean seed from a reputable seed company!
- Know which diseases are challenging based on your field history and common foliar diseases.
- Select varieties with appropriate disease packages for your challenges. Consider varieties with broad race resistance when applicable.
- The more diseases you can address with variety selection, the further ahead you will be.

## CHOOSE REPUTABLE SEED

**What chance do you stand to raise a healthy, economically profitable crop if it comes in with a bacterial or viral infection in the seed?** Can you have a decent potato crop if the tubers carry *Dickeya* black leg or late blight? Odds are not good, because in both cases you'll have decreased plant population, lower vigor, and suppressed yield along with increased management costs. And you'll have a real risk of spreading seed-borne diseases from one infected seed lot to an entire crop of transplants in the greenhouse or from one field to the next with passing equipment, crews, insects, or air currents (dispersal method is disease specific).

Only buy seed from reputable seed companies. **If a seed certification program exists for your crop only buy certified seed – I'm looking at you, potatoes!** If there is a common seed-vectored disease concern, specifically ask potential seed providers what they do to screen for, prevent, and treat their seed to ensure a clean, disease-free product. For example, I'd ask a garlic seed provider if they have tested for garlic bloat nematode. I'd ask a tomato seed provider if they have hot-water treated their seed to kill bacterial pathogens. A reputable seed company will be able to provide detailed answers to these questions. They will also stand behind their product and will work with you in a transparent way if they discover a problem in one of their seed lots.

**If you're saving seed yourself**, or buying from someone who does, there are best practices that should be followed to avoid carrying problems between years. And please, please, don't save your own potato seed if there was late blight in

your or a neighboring county last year. Your neighbors really don't want you to be the one responsible for starting the 2020 outbreak.

## SELECT RESISTANT VARIETIES

**I think selecting resistant varieties is the easiest and most fun way to preserve plant health.** You get the fun of

looking through the seed catalogues, while plant breeders have done all the work! There has been a lot of work to develop crop varieties that are resistant or tolerant to common diseases. For those farming organically, disease resistant varieties is your very best management tool.

The varietal improvements related to plant health are referred to as the crop's "disease package". **The language describing the disease package can be a little confusing, because there are different definitions for "resistant" and "tolerant."**

When I say resistant, I mean plants that won't get sick or will have such little disease you have to work to find it. When I say tolerant, I mean plants that hold up better than most varieties to high disease pressure scenarios. Tolerant plants may still get sick, but they will outlast their susceptible counterparts, have less severe symptoms, and will realize more of their yield potential. Susceptible plants are the ones that don't have any enhanced or proven ability to fend off disease. **Ask your seed supplier how they define resistant vs. tolerant.**

Tolerant and resistant plants will perform better when faced with moderate to high disease pressure and are the most appropriate choice for fields with a known history of soil-borne disease. **Verticillium and fusarium tolerances are important advancements for New York crops because we tend to have wet growing conditions!** Some crops, like cucurbits, offer genetic resistance to common viruses. Other disease packages focus on addressing foliar diseases. For example, there are several late blight resistant tomato varieties are available for slicer, roma, and cherry tomatoes. Spinach, basil, and cucumbers have all been bred to be resistant to their respective species of downy mildew. Many squash, zucchini, and pumpkin varieties offer tolerance to powdery mildew. Growers using disease tolerant or resistant plants almost always enjoy delayed or fewer fungicide applications, which saves money and time.

**On occasion, there is a tradeoff between varieties with a strong disease package and susceptible varieties with highly desirable horticultural traits.** One trade-off may be that the resistant/tolerant variety may yield later or less than a susceptible variety **when disease pressure is low**. In tomatoes, a few of the late blight resistant varieties can be a bit lack-luster in taste. In such situations, the resistant/tolerant variety should be used as a risk-reduction tool. Tomatoes are a valuable crop and so a less flavorful tomato is far better than no tomatoes. Late blight has become an annual problem



*continued on next page*



in NY. Thus, it is a good practice to plant a small section of one field to late blight resistant varieties to best prepare for all scenarios.

### WHY ARE THERE SO MANY OPTIONS FOR A CERTAIN DISEASE WITHIN A CROP?

Understanding the concept of “disease race” is the last piece to successfully using tolerant and resistant varieties. **Several plant diseases have different sub-populations with varying traits, called races or strains.** Late blight is a good case-study. To date, there have been 25 races of late blight identified in the United States. Each race is like a breed of cattle. Some races infect potato and tomato similarly. Some races are very aggressive on potato and leave tomatoes alone, or vice-versa. It’s like how we separate cattle into dairy, beef or dual purpose. Other races have developed resistance/tolerance to specific fungicides or have other special traits like being able to infect nightshades or petunias. That’s like the specific attributes of each cattle breed – a high production Holstein, a high butterfat Jersey, or a heat tolerant Brahman-cross beefer. A few races have simply disappeared with time, while others have haunted producers for decades, as happens with breeds of cattle.

Each race becomes unique because it is slightly genetically different. **Oftentimes, the functional difference between disease races is related to the race’s ability to overcome the genetic resistance of a host plant.** Again, let’s use late blight as a case study. There are several different tomato resistance genes available in commercial varieties. Many late blight

races cannot overcome any of the common tomato resistance genes. A few races have developed a biological work-around to one or more of the resistance genes. Those races can cause disease on some resistant varieties but not on others. Most late blight resistant tomato varieties have more than one resistance gene bred into them, so even if a race overcomes a single resistance gene, there is another that prevents or substantially limits/slowers late blight progression.

**Seed companies will tell you how many races a variety will stand up to.** In the case of spinach downy mildew, the catalogue may list something like “DM races, 1-8 and 14”. Fusarium or verticillium listings may give an abbreviation of the disease name and a race number like “Fus2”. It can be helpful the prevalent race of the disease, to know which resistance genes can be expected to work well. This is one reason why we want to hear about late blight outbreaks – so we can get the race tested.

Here’s your one sentence wrap up that encompasses all the points in a practical way: When you’re selecting your resistant tomato varieties from a reputable seed dealer for your hedging-the-bets planting, look for a package that will treat the common NY late blight race (US-23) and don’t forget to ask them about what they do to prevent bacterial disease contamination.

*I hope to see you at the 2/20 meeting in North Collins or the 3/30 Cole Crops School in Newark! Look for more Cole Crops School info in the March issue of VegEdge. ●*

## 2020 Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production Now Available

*Pesticide Management Education Program, Cornell University*

The Pesticide Management Education Program (PMEP) at Cornell University is pleased to announce the availability of the *2020 Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production*.

Written by Cornell University specialists, this publication is designed to offer producers, seed and chemical dealers, and crop consultants practical information on growing and managing vegetable crops in New York State. Topics include general culture, nutrient management, transplant production, postharvest handling, organic production, and managing common vegetable crop pest concerns.

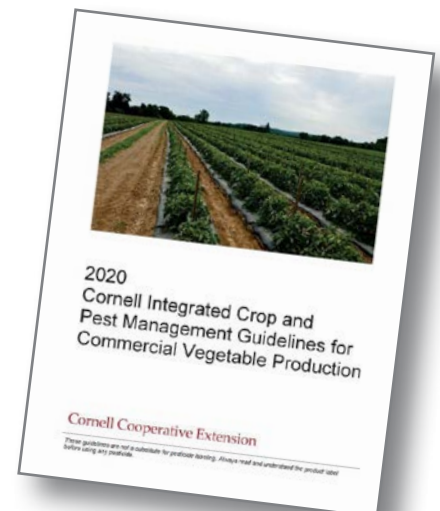
A [preview of the Vegetable Guidelines](https://cropandpestguides.cce.cornell.edu) can be seen online at <https://cropandpestguides.cce.cornell.edu>.

Highlighted changes in the 2020 Vegetable Guidelines include:

- Updated pesticide options for economically important vegetable crop pests.
- Completely revised weed management chapter.
- Updated online crop and pest management resources.

Cornell Crop and Pest Management Guidelines are available as a print copy, online-only access, or a package combining print and online access. The print edition of the *2020 Vegetable Guideline* costs \$41 plus shipping. Online-only access is \$41. A combination of print and online access costs \$57.50 plus shipping costs for the printed book.

Cornell Guidelines can be obtained through many local Cornell Cooperative Extension offices (call ahead to ensure availability) or from The Cornell Store at Cornell University. To order from The Cornell Store, call (844) 688-7620 or [order online](https://www.cornellstore.com/books/cornell-cooperative-ext-pmep-guidelines) at <https://www.cornellstore.com/books/cornell-cooperative-ext-pmep-guidelines>. ●



## Upcoming Events

View all CCE Cornell Vegetable Program events at [CVP.CCE.CORNELL.EDU](http://CVP.CCE.CORNELL.EDU)

### New York Certified Organic (NYCO) Meeting

February 11, 2020 (Tuesday) | 10:00 AM start; bring a dish to pass for the potluck lunch

Martin Auction Barn, 1036 NY Route 318, Waterloo, NY

Reduced tillage and weed control in organic field crops and mycotoxins risk to humans and livestock are on the February 11, 2020 New York Certified Organic (NYCO) meeting agenda. There is no charge to attend; no registration required. Organizers ask those attending to bring a dish to pass or a donation for the potluck lunch.

Cornell University Soil and Crop Sciences Professor Matthew Ryan and graduate student Uriel Menalled of the Sustainable Cropping Systems Lab will discuss organic no-till practices and benefits. Dr. Lynn M. Sosnoskie, an assistant professor of weed ecology and weed management for specialty crop systems with the Cornell University School of Integrative Plant Science at Cornell AgriTech, will review the biology, ecology, and management of field bindweed, *Convolvulus arvensis*, one of the most noxious weeds in the world. John Winchell from Alltech will discuss mycotoxins in forages. Winchell earned a dairy science degree at The Ohio State University and has been practicing dairy nutrition for more than 20 years. He joined Alltech in 2016 as a territory manager, specializing in forage quality, dairy nutrition, and mycotoxin control, in New York.

For more information, contact NYCO Meeting Coordinator Fay Benson with the CCE South Central New York Dairy and Field Crops Team at [afb3@cornell.edu](mailto:afb3@cornell.edu) or 607-745-3807. The 2020 NYCO Meetings were planned with the assistance of Emily Reiss, Ph.D., of the Crop Team at Kreher Family Farms, Clarence, N.Y., and Luke Gianforte of Gianforte Farm, Cazenovia, N.Y.

### 2020 Upper Genesee Valley Produce Growers Meeting

February 14, 2020 (Friday) | 12:30 PM - 4:00 PM

Genesee Valley Produce Auction house, 855 Co. Rd 3, Freedom, NY 14065

A bit of something for everyone! This meeting will feature experts from Cornell Cooperative Extension discussing food safety in auction lots and quality control, how to successfully lengthen the growing season, making the most of a small grain rotational crop, and common disease and pest info. Summer squash, cabbage and pepper production tips will be presented by Mark Zittel, an experienced produce and greenhouse grower for 20+ years. Participants will have the opportunity to join group discussion in breakout sessions of their choosing. And don't forget to stop by the Demo Table to see weeds and soil health exhibits. The [full agenda](#) is available on our website [cvp.cce.cornell.edu](http://cvp.cce.cornell.edu)

Cost: FREE but pre-registration is requested by February 12. For more information, contact Elizabeth Buck at 585-406-3419.

### 2020 Lake Erie Region Vegetable Meeting

February 20, 2020 (Thursday) | 8:00 AM breakfast; 8:45 AM - 12:00 PM educational program

Langford Fire Hall, 3901 Langford Rd, North Collins, NY 14111

At this meeting co-hosted by Timac Agro USA and Cornell Cooperative Extension, representatives from IVA Sprayers, BASF, Timac Agro USA, and Gowan will share information about their product offerings and how to use them on specialty crops. Dr. Chris Smart from Cornell will discuss sanitation and prevention techniques for greenhouse and transplant handling to minimize bacterial diseases in peppers and tomatoes. Dr. Lynn Sosnoskie, Weed Scientist for Cornell, will lead a focus group to identify grower research priorities. Additionally, Sosnoskie will provide insights on how to recognize herbicide resistance and adjust weed management strategies appropriately. DEC recertification credits will be available. The [full agenda](#) is available on our website [cvp.cce.cornell.edu](http://cvp.cce.cornell.edu). Cost: FREE but pre-register for breakfast by February 17. Call 716-992-3830 to register. For more information about the program, contact Elizabeth Buck at 585-406-3419.

### 2020 NYS Dry Bean Meeting

March 10, 2020 (Tuesday) | 9:00 AM - 12:00 noon; lunch will be available following the meeting

First United Methodist Church, 8221 Lewiston Rd (Route 63), Batavia, NY 14020

Join us for research and production updates on dry bean varieties and bean breeding, weed management, Western bean cutworm, and white mold disease. A market analysis will be provided as well. We will review research priorities and gather suggestions for future educational programs. DEC recertification credits will be available. The [meeting agenda](#) is posted on our website [cvp.cce.cornell.edu](http://cvp.cce.cornell.edu)

Cost: \$25 per Cornell Vegetable Program enrollee; \$35 all others. Lunch is included in the registration fee. Stay to eat and network with fellow growers and event speakers. [Register online](#) now. Prefer to register by mail? We will be mailing information and a registration form in mid-February to those enrollees that indicated an interest in dry beans on their enrollment form. For more information, contact Margie Lund at 607-377-9109.

*continued on next page*

## Upcoming Events

View more events at [CVP.CCE.CORNELL.EDU](http://CVP.CCE.CORNELL.EDU)

### Raspberries 101 Workshop

April 1, 2020 (Wednesday) | 5:30 PM

CCE Wyoming County, 36 Center St, Room LC1, Warsaw, NY

Have you ever wanted to grow raspberries, but didn't know where to start? This course hosted by CCE Wyoming County will help you get started, from selecting and preparing a planting site, to choosing varieties and planting them. You will also learn about trellis systems and systems and how to prune and fertilize the plants through the seasons. This event will be taught by Esther Kibbe, Berry Specialist with Cornell Cooperative Extension, Harvest NY. Esther brings a wealth of berry background having worked for Driscoll's Inc as a plant breeder and global trainer for scientific staff, and a consultant for a number of farms in Western NY.

Cost: \$10 per farm. Register by calling Lisa at 585-786-2251 x126 or [email Lisa](mailto:lisa@stokesseeds.com). Or [register online](http://registeronline.com). Questions? Contact Don Gasiewicz at 585-786-2251 x113.

## Stokes Seeds Acquires Siegers Seed Company

*Stokes Seeds, Inc.*

Stokes Seeds® has announced the acquisition of the Siegers Seed Company business of Holland, MI, effective December 19, 2019.

Stokes Seeds has retained the employees of Siegers Seed Company and is continuing operations from the Michigan, Georgia and Florida locations with the newly combined organizations doing business under the Stokes Seeds brand. The ongoing 2019-2020 sales season will be a transition year with primary focus on customer service. Siegers Seed Company customers can expect the same level of service, provided by the same staff, from the same facilities.

The acquisition combines two organizations that have each operated for over 100 years in the vegetable seed industry. Stokes Seeds will now serve commercial growers from five US locations in Buffalo, NY, Vineland, NJ, Holland, MI, Moultrie, GA and LaBelle, FL. Stokes Seeds expanded US market area now includes the Northeast, Mid-Atlantic, Midwest, Mid-South and Southeast. Eighteen territory managers will serve growers with the best seed prescriptions to meet their production and profit goals.

"We're pleased to make this acquisition, expand our US market coverage to include the Southeast, and combine the best attributes of each business to place Stokes Seeds in an excellent position to continue our growth and better serve growers in the regions we serve," stated Wayne Gale, Stokes Seeds President.

Stokes Seeds is a leading distributor of commercial vegetable seed in the United States and Canada, with operations in Ontario, Canada and the five locations in the US. With twenty-five experienced territory managers, exciting new varieties from world-class vendors and exceptional customer service, Stokes Seeds continues to be the seed supplier of choice for growers across North America.

For more information, contact Stokes Seeds at 800.263.7233 or [www.StokeSeeds.com](http://www.StokeSeeds.com). ●

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# Cornell Cooperative Extension Cornell Vegetable Program

480 North Main Street  
Canandaigua, NY 14424



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.

## VEGETABLE SPECIALISTS

**Elizabeth Buck** | 585-406-3419 cell | [emb273@cornell.edu](mailto:emb273@cornell.edu)  
fresh market vegetables, weed management, soil health

**Robert Hadad** | 585-739-4065 cell | [rgh26@cornell.edu](mailto:rgh26@cornell.edu)  
farm food safety, organic, business & marketing, fresh market vegetables

**Christy Hoepting** | 585-721-6953 cell | [cah59@cornell.edu](mailto:cah59@cornell.edu)  
onions, cabbage, broccoli, pesticide management

**Julie Kikkert, Team Leader** | 585-313-8160 cell | [jrk2@cornell.edu](mailto:jrk2@cornell.edu)  
processing crops (table beets, carrots, peas, snap beans, sweet corn)

**Margie Lund** | 607-377-9109 cell | [mel296@cornell.edu](mailto:mel296@cornell.edu)  
potatoes, dry beans, and post-harvest handling and storage

**Judson Reid** | 585-313-8912 cell | [jer11@cornell.edu](mailto:jer11@cornell.edu)  
greenhouses/high tunnels, small farming operations, fresh market vegs

## PRECISION AG SPECIALIST

**Ali Nafchi** | 585-313-6197 cell | [anafchi@cornell.edu](mailto:anafchi@cornell.edu)

## PROGRAM ASSISTANTS

John Gibbons | [jpg10@cornell.edu](mailto:jpg10@cornell.edu)

Angela Ochterski | 585-394-3977 x426

Sarah Vande Brake | [sv483@cornell.edu](mailto:sv483@cornell.edu)

Emma van der Heide | [ev247@cornell.edu](mailto:ev247@cornell.edu)

Caitlin Vore | [cv275@cornell.edu](mailto:cv275@cornell.edu)

## ADMINISTRATION

Peter Landre | [ptl2@cornell.edu](mailto:ptl2@cornell.edu)

Steve Reiners | [sr43@cornell.edu](mailto:sr43@cornell.edu)

**Cornell Cooperative Extension  
Cornell Vegetable Program**

For more information about our program, email [cce-cvp@cornell.edu](mailto:cce-cvp@cornell.edu) or visit [CVP.CCE.CORNELL.EDU](http://CVP.CCE.CORNELL.EDU)



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