



Produce auctions are prosperous for sellers, buyers, and the communities in which they are located. A new CVP video highlights this fact.

**PAGE 1**



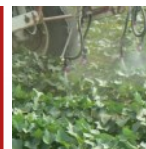
Love Beets USA will begin processing and packaging fresh, marinated and organic beets and beet products in Rochester in November 2015.

**PAGE 2**



Several products can be applied to potato seed before planting or in-furrow during planting. Learn more about your options.

**PAGE 5**



There are many new fungicides registered in NYS in 2015. Read about all of the vegetable pesticide updates.

**PAGE 6**

A large background image for the VEGEdge cover, showing rows of young green plants growing in a field covered with white plastic mulch. A thick red and yellow curved graphic element separates the top content from the main title area.

# VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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**Cornell University**  
Cooperative Extension  
Cornell Vegetable Program

*Photo: Judson Reid*

## Prosperity Through Auction

*Elizabeth Newbold, Harvest New York*

Produce auctions have a positive impact on the communities in which they are located, as well as, on those who sell and those who buy at the auction. Currently, there are six produce auctions in New York State. These auctions are aggregation points that allow local farmers to sell their produce in wholesale lots to buyers from across the region.

Cornell Cooperative Extension has supported the development and growth of these auctions since their inception. To document the economic impact of produce auctions on agriculture, local businesses, family farms, and produce buyers, CCE interviewed 18 of the top sellers and buyers at the Seneca Produce Auction in Ovid, NY. Interview questions were developed to assess mid and long-term outcomes of a produce auction.

### FARM CHANGES IN RESPONSE TO A PRODUCE AUCTION

We asked how farming practices had changed as a result of



Small lots ready for sale at the Finger Lakes Produce Auction, June 2014.  
*Photo: Angela Parr, Cornell Vegetable Program*

*continued on page 3*



**VegEdge** newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serving 11 counties in Western New York.

The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

We're interested in your comments. Contact us at:  
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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.

This publication contains pesticide recommendations. Changes in pesticide regulations occur constantly and human errors are possible. Some materials may no longer be available and some uses may no longer be legal. All pesticides distributed, sold or applied in NYS must be registered with the NYS Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide usage in NYS should be directed to the appropriate Cornell Cooperative Extension (CCE) specialist or your regional DEC office.

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](mailto:cce-cvp@cornell.edu) or write to us at Cornell Vegetable Program, 480 North Main Street, Canandaigua, NY 14424.**



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## <<< BREAKING NEWS >>>

### Governor Cuomo Announces 140 New Jobs in Rochester as LiDestri Foods and G's Fresh Create Partnership: Love Beets USA, LLC

4/28/15 – Governor Andrew M. Cuomo today announced LiDestri Foods Inc. of Fairport, NY and G's Fresh Ltd. of the United Kingdom have partnered to form Love Beets USA, LLC, a \$17 million Rochester-based joint manufacturing venture for the processing and packaging of fresh, marinated and organic beets and beet products. G's Fresh, which currently produces Love Beets abroad, will invest in the new partnership and leverage LiDestri's leadership in the food industry to produce its popular product in Rochester and expand distribution throughout the U.S. The newly formed company will be located at the LiDestri Foods manufacturing complex at Eastman Business Park in Rochester and is slated to begin operations in November 2015.

...Local growers are expected to benefit with sharply higher demand of organic beet crops and opportunity to move their products into new markets and increase sales. Love Beets has a goal of having the majority of its beets sourced by New York State farmers.

...Governor Cuomo said, "Not only will this create jobs and economic activity, it will also help support our farmers and reinforce the buy-local movement that is Taste NY. I welcome G's Fresh to New York and congratulate LiDestri's on this new venture."

Read the full press release at <http://www.governor.ny.gov/news/governor-cuomo-announces-140-new-jobs-rochester-lidestri-foods-and-gs-fresh-create-partnership>

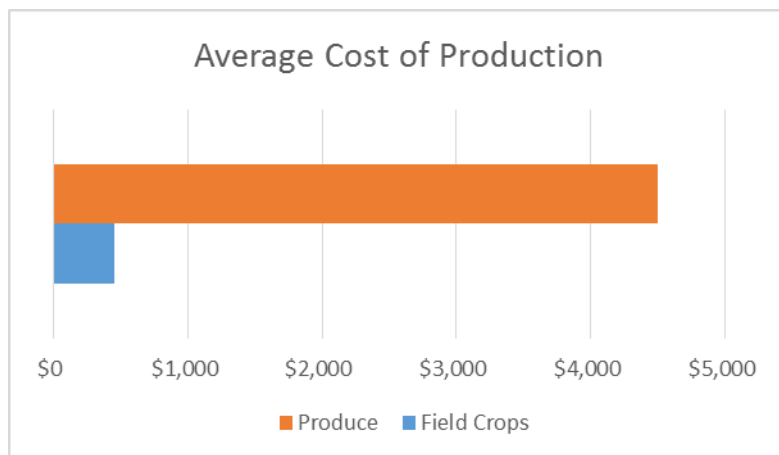
the produce auction and were then able to calculate increased economic activity. The auction serves as a good and ready market that provides growers with the confidence to invest in expansion of their produce acreage. Of surveyed farmers 88% devoted additional acreage to growing produce with 66% citing the existence of the auction as the reason for the shift. Prior to the existence of the auction, this acreage had been devoted to field crops such as hay. The shift in production represents an increase of ten times the input costs, on average a total of \$4,500 per acre. This escalation of economic activity is seen in the farmer's need to purchase additional seed, transplants, fertilizer, and equipment for the production of fruits and vegetables. This, in addition to other costs such as labor, supplies, and packaging are all primarily purchased in local stores and markets, creating a multiplier effect to the local economy from the existence of the produce auction. Also, the auction reduced farmer's time spent on marketing, and allowed them to market a larger percentage of their produce than retail outlets.

100% of the growers cite Cornell Cooperative Extension as an important information resource. This resource is accessed through a number of channels, including CCE newsletter, produce auction winter and/or summer meeting, in-person visits from CCE staff, and phone calls with CCE staff.

#### PRODUCE AUCTION ALLOWS BUYERS TO EXPAND AND OPERATE BUSINESSES MORE EFFICIENTLY

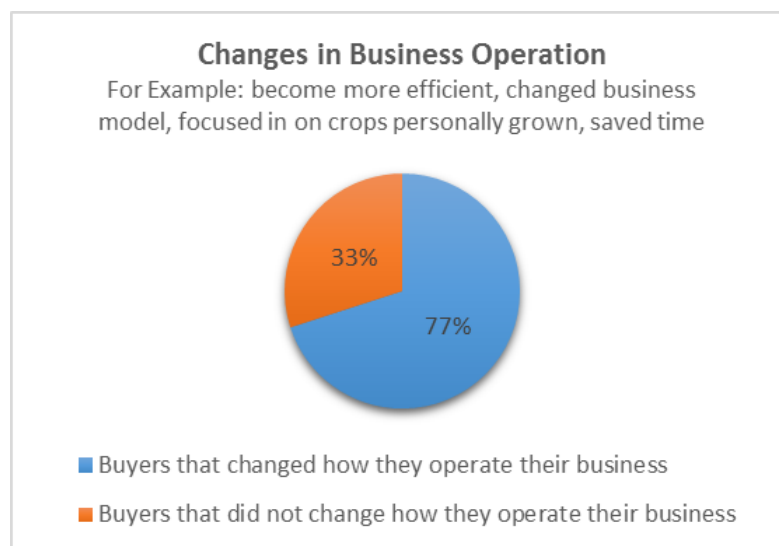
We asked buyers to tell us why they buy produce through the auction and found that all the buyers value the auction for more reasons than just price. Most important to the buyers is that the auction sells high quality *local* product. 100% of the buyers reported that they label or promote the produce as "local", from "Seneca County", or "Grown in NY". They reported that 'local' is important to their consumers. Also, buyers reported that the auction offers access to fresh produce that is of higher quality since most items are picked/harvested within a day of auction. Buyers appreciate the competitive pricing and find that they can often purchase the product considerably cheaper than other sources. Therefore, they can lower retail prices for the customers and maintain the same or better margins. Finally, the buyers report to benefit from the flexibility they have when buying produce at the auction. They are able to pick out exactly what they want since they have the opportunity to peruse the produce before the auction.

Because the auction carries a large selection and many varieties of produce, 66% of surveyed buyers reported expanding their business operations



because of the auction. They are now able to carry a larger stock which has resulted in more total sales as well as carrying a greater variety of produce.

Access to produce through the auction has led buyers to change their business operation, saving them time and allowing them to operate more efficiently. Of the buyers interviewed, 55% operate farm stands and 22% sell produce at farmers' markets. The variety of the produce sold at the auction provides for a convenient one stop location to find the many types of produce they need. The auction occurs on a regular selling and payment schedule providing the buyers with consistent timing and payment. This means simplified sourcing, payments and schedules.



The presence of the auction benefits unrelated businesses in the county since 75% of buyers reported that they patronize other local business weekly when they come to the auction. On average, they reported spending \$1,653 over the course of the auction season at these other businesses!

[Check out the new produce auction video](#) that highlights this economic impact information and much more. It is now available on the Cornell Vegetable Program's YouTube channel, [www.youtube.com/user/cccvp](https://www.youtube.com/user/cccvp).



New York Produce Auctions



# Glyphosate is Back in the News

Darcy Telenko, CCE Cornell Vegetable Program

Headlines reading “Stop Making Us Guinea Pigs”; “Weed Killer, Long Cleared, is Doubted”; and many others are making their rounds.

The media has jumped on the news that the working group of World Health Organizations International Agency for Research on Cancer (IARC) had classified glyphosate “as probably carcinogenic to humans” (Group 2A). The IARC will be publishing on glyphosate and a number of other organophosphate pesticides including parathion, malathion, and diazinon (volume 112 of the IARC Monographs<sup>1</sup>). See table below for the current classification system and the number of agents assigned to each group by the IARC. This new classification has reinvigorated the debate on the use of glyphosate (Round-up) and its tie to genetically engineered crops (“GMOs”). Monsanto disagrees with the IARC classification for several reasons furthering the debate.

**Table 1.** IRAC's current classifications

<u>Group</u>	<u>Description</u>	<u># of agents</u>	<u>Examples</u>
Group 1	<i>Carcinogenic to humans</i>	116	UV rays, wood dust, tobacco
Group 2A	<i>Probably carcinogenic to humans</i>	73	lead compounds, frying emissions from high temperature, glyphosate
Group 2B	<i>Possibly carcinogenic to humans</i>	287	coffee, aloe vera, dry cleaning worker exposure
Group 3	<i>Not classifiable as to its carcinogenicity to humans</i>	503	captan, electric fields-static, hair coloring products-personal use
Group 4	<i>Probably not carcinogenic to humans</i>	1	caprolactam (precursor to nylon 6)

## But what does this mean to growers?

Right now – **nothing**

Pesticide toxicology and regulations in the United States are administered by the Environmental Protection Agency (EPA). The EPA's Integrated Risk Information System (IRIS) is the human health assessment program that evaluates information on health effects that may result from exposure to environmental contaminants. The IRIS currently classifies glyphosate as “not classifiable as to human carcinogenicity” (Group D). It is noted that *“glyphosate was originally classified as C, possible human carcinogen, on the basis of increased incidence of renal tumors in mice. Following independent review of the slides the classification was changed to D on the basis of a lack of statistical significance and uncertainty as to a treatment-related effect.”*

EPA Pesticides Program and individual states (DEC in NY) regulate the registration and license of pesticides used in the United States. Currently the biggest change coming down the line will be EPA's regulations on resistance man-

agement in weeds and the EPA will be requiring resistance management plans for glyphosate to be established.

As for the hype here's the take home message:

- Glyphosate is a broad-spectrum herbicide that is used in more than 750 different products for agriculture, forestry, urban and the home
- There is a real chance pesticides could cause cancer and we should be careful when using them
- Follow all label directions for use and wear appropriate Personal Protective Equipment (PPE) at all times
- There is a long list of things that probably cause cancer – UV rays, wood dust, and tobacco are just a few belonging to Group 1
- There is limited evidence that increased risks for non-Hodgkin lymphoma have been associated with occupational exposure in case-studies from US, Canada and Sweden
- Yes glyphosate usage has increased dramatically as tool in combination with Round-up Ready crops that include corn, cotton, soybean, canola, alfalfa and sorghum, but genetic engineering debate extends further than just herbicide resistance and cannot be grouped as a whole with this finding (a topic for a future article).

<sup>1</sup> International Agency for Research on Cancer Volume 112: Some Organophosphate insecticides and herbicides: tetrachlorvinphos, parathion, malathion, diazinon and glyphosate. IARC Working Group. Lyon; 3-10 March 2015. *IRAC Monogr Eval Carcinog Risk Chem Hum* (in press). ●

# Seed Piece & In-Furrow Treatments for Managing Diseases in Potatoes

Margaret McGrath, Cornell, and Sandra Menasha, CCE Suffolk County

There are several products that can be applied to potato seed before planting or in furrow during planting. Fungicides are helpful in minimizing losses to seed-borne and soil-borne diseases, but they are not a substitute for certified seed.

Emesto Silver is a new seed piece fungicide recently registered in NYS. It is a liquid that must be applied with equipment for liquids like a Milestone Treater. Emesto Silver contains two active ingredients both in chemical groups not in other products for application to seed or in furrow: penflufen and prothioconazole. This fungicide is labeled for *Rhizoctonia* black scurf, *Fusarium* dry rot, and silver scurf.

Seed treatments containing mancozeb plus a targeted fungicide are best for controlling tuber-borne late blight and several soil-borne diseases like *Rhizoctonia* black scurf, *Fusarium* dry rot, silver scurf and black dot. These include Maxim MZ (contains a targeted fungicide in FRAC Group 7), Moncoat MZ (FRAC 7), Evolve (FRAC 1 and 27), and Tops MZ (FRAC 1). The FRAC 27 ingredient in Evolve has targeted activi-

ty for tuber-borne late blight. The same ingredient is in Curzate 60DF. Ridomil products are not listed or recommended as an in-furrow or banded treatment for controlling late blight because adequate coverage is difficult since numerous eyes occur on one seed piece and contact on all areas of the tuber cannot be guaranteed, and additionally Ridomil should only be used when the pathogen genotype present is known to be sensitive to this fungicide. Cruiser Maxx\* contains a FRAC group 12 fungicide plus an insecticide. It should be combined with Potato Seed Treater (mancozeb) for late blight.

Protect against storage rots caused by Oomycete pathogens, *Pythium* leak and pink rot, by applying Ridomil products in-furrow. Where Ridomil resistance is a concern, Ranman can be used in-furrow to control for pink rot. A second sidedress application of Ranman applied at hilling may be necessary for additional control.

Quadris in-furrow has shown excellent activity against *Rhizoctonia*, silver scurf and black dot, and has been widely

adapted. *Note: In research trials, delayed emergence and reduced yields of certain varieties have been noted when Quadris was applied above 8 fl oz/1000 ft.* Headline SC is in the same fungicide group as Quadris (strobilurin; FRAC Group 11) and is also labeled for in-furrow applications, but only provides control of *Rhizoctonia*.

Moncut 70DF\* (FRAC 7) is another fungicide for in-furrow application. It has activity for powdery scab (suppression) as well as *Rhizoctonia* black scurf.

Organic (OMRI-listed) products include RootShield Plus WP which can be applied to seed or in-furrow for *Rhizoctonia*. in-furrow treatments include Serenade Soil for control or suppression of *Rhizoctonia*, *Pythium*, *Fusarium* and pink rot; Double Nickle 55 in-furrow for *Rhizoctonia* and other potential soil-borne pathogens; Actinovate AGF for *Fusarium* and *Rhizoctonia* and potentially for *Pythium* and pink rot; and Bio-Tam for *Fusarium* and *Rhizoctonia*.

\* use on Long Island is prohibited. ●

## Warm Potato Seed Before Planting

Sandy Menasha, CCE Suffolk Co. (LI Fruit & Veg Update, 4/9/15); edited by C. MacNeil, Cornell Vegetable Program

Be sure to warm potato seed to 45-50° F before handling or planting. Cold seed is much more susceptible to bruising and tuber rot, which can lead to stand problems. All seed handling, cutting, and storage equipment should be thoroughly washed and disinfected prior to cutting seed, and in between seed lots. Quaternary ammonium compounds and sodium/calcium hypo-

chlorite products are effective disinfectants. If soil organic matter is not removed, however, the disinfectants will be neutralized before they can do their job. Cleaning the equipment between seed lots may seem like a waste of time but the cutting process is a very effective means of spreading disease from one seed lot to another. If a disease problem is noticed, shut down

and clean the equipment, discontinue use of that seed lot, or attempt to grade out diseased tubers before cutting, making sure to thoroughly clean everything the diseased seed lot has come in contact with. For best early crop vigor, plant potato seed that's about 1 ¾ oz. in size. Seed less than 3 oz. should be planted whole. ●

## Kill Rye Cover Crop at 6-8 Inches!

While temperatures have been cold, we had enough warm weather a couple weeks ago to get grass cover crops growing well. For vegetable growers Thomas Bjorkman, Cornell, recommends that rye cover crops especially, be killed when just 6-8" tall. Wheat and triticale should also be killed when small. Upon decomposition, the young cover crop will readily release carry-over N from last year's crops, rather than tying up N as more mature rye is likely to do. The young grasses will also pose less risk of stunting subsequent vegetable crops. ●

# 2015 Vegetable Pesticide Updates – Lots of New Fungicides

Christy Hoefting, CCE Cornell Vegetable Program

**Changes in pesticide registrations occur constantly and human errors are possible. Read the label before applying any pesticide. No endorsement of products or companies is made or implied. Other pesticide updates that we missed are welcome. Information was last updated on April 24, 2015. Updates after this date will be posted in future issues of VegEdge.**

Note: We only included the uses that pertain to vegetables. Several labels include uses in fruit and field crops as well.

## New Registrations (i.e. new EPA No.)

- **APPROACH fungicide:** (EPA No. 352-840, a.i. picoxystrobin, DuPont). This is the first product labeled in New York State with this active ingredient. For control of rusts, Northern leaf spot, Gray spot, Alternaria, white mold, Septoria, etc. in sweet corn and in dry beans & peas.
- **EMESTO SILVER fungicide:** (EPA No. 264-1123, a.i. penflufen + prothioconazole, Bayer). A potato seed piece treatment for control of black and silver scurf, and Fusarium.
- **EXIREL insecticide:** (EPA No. 352-859, a.i. cyantraniliprole, DuPont). For foliar applications to Brassica, bulb, cucurbit, fruiting, and leafy vegetables; commercially grown greenhouse eggplant, pepper and tomato; for pest management of sucking and chewing insects such as aphids, thrips and worms, and suppression of certain insect vectored diseases and optimization of the crop's potential.
- **OMEGA 500F fungicide:** (EPA No. 71512-1, fluazinam, ISK BioSciences). This is one of the first products labeled in New York State with this active ingredient. For control of club root in Brassicas, late blight in potatoes, white mold, Botrytis, Alternaria and downy mildew in carrot, head & leaf lettuce, succulent and dry peas & beans, onions, cucurbits and fruiting vegetables.
- **PROTEXIO fungicide:** (EPA No. 59639-179, a.i. fenpyrazamine, Valent). This is the first product labeled in New York State with this active ingredient. For control of Botrytis and Sclerotinia in head & leaf lettuce.
- **SERIFEL biofungicide:** (EPA No. 71840-18, a.i. *Bacillus amyloliquefaciens* MBI 600, BASF). For suppression of Alternaria, downy mildew, Anthracnose, Gummy stem blight, Late Blight, etc. in cucurbits, fruiting vegetables (tomatoes, peppers, etc.) and tuberous & corm vegetables (e.g. sweet potato).
- **VERIMARK insecticide:** (EPA No. 352-860, a.i. cyantraniliprole, DuPont). For soil applications to brassica, cucurbit, fruiting, leafy, and tuberous and corm vegetables for pest management of sucking and chewing insects such as aphids, worms and thrips, suppression of certain insect vectored diseases and optimization of the crop's potential.
- **XANTHION fungicide:** (EPA No. 7969-368, a.i. *Bacillus subtilis* strain MBI 600 + pyraclostrobin, BASF). For control of soilborne/seedling diseases such as Fusarium and Rhizoctonia and plant health using in-furrow applications to sweet corn.
- **ZING! fungicide:** (EPA No. 10163-331, a.i. zoxamide + chlorothalonil, Gowan). For control of Alternaria, Downy mildew, Botrytis, Late Blight, etc. in cucurbits, onions & garlic, potatoes and tomatoes.

## Label Expansions (new crops/pests added to updated version of label)

- **REASON fungicide:** (EPA No. 264-695, a.i. fenamidone, Bayer). Added a seed piece treatment for late blight control in potatoes.
- **REVUS fungicide:** (EPA No. 100-1254, a.i. mandipropamid, Syngenta). Added basil for control of downy mildew.

## FIFRA 2(ee) Recommendations (new use on crop already on label)

- **BRAVO ULTREX AGRICULTURAL fungicide:** (EPA No. 50534-201-100, a.i. chlorothalonil, Syngenta). For use against the unlabeled pests Plectosporium blight and Septoria leaf spot (2 labels) on cucurbit crops: cantaloupe, muskmelon, honeydew, watermelon, pumpkin and winter squash.
- **BRAVO WEATHER STIK AGRICULTURAL fungicide:** (EPA No. 50534-188-100, a.i. chlorothalonil, Syngenta). For use against unlabeled pest Septoria leaf spot in cucurbit crops (same as Bravo Ultrex).
- **DITHANE DF RAINSEILD fungicide:** (EPA No. 62719-402, a.i. mancozeb, Dow AgroSciences). For control of unlabeled pest Phytophthora blight on cucumber, melons, summer squash and water melon.
- **ENTRUST SC insecticide:** (EPA No. 62719-621, a.i. spinosad, Dow AgroSciences). For use on summer and winter squash, pumpkin, cucumber, muskmelons, and edible gourds against unlabeled pest squash vine borer.
- **MANZATE FLOWABLE fungicide:** (EPA No. 70506-236, a.i. mancozeb, United Phosphorous). For control of unlabeled pest Phytophthora blight on cucumber, melons and summer squash.
- **MANZATE PRO-STIK fungicide:** (EPA No. 70506-234, a.i. mancozeb, United Phosphorous). For control of unlabeled pest Phytophthora blight on cucumber, melons, summer & winter squash, pumpkin and watermelon.

continued on next page

### Supplemental Labels

- **GAVEL 75DF fungicide:** EPA No. 10163-6414, a.i. mancozeb + zox-amide, Gowan). For use in all bulb onions & garlic for control of Botrytis, purple blotch and downy mildew.
- **RIDOMIL GOLD SL fungicide:** EPA No. 100-1202, a.i. mefanoxam, Syngenta). For use as a seed piece treatment for tuber rots in potatoes.
- **VIVANDO fungicide:** EPA No. 7969-284, a.i. metrafenone, BASF). For control of powdery mildew in fruiting and cucurbit vegetables (2 separate labels).

### FIFRA Section 24(c) Special Local Need Labels

- **CAPAROL 4L herbicide:** (EPA No. 100-620, SLN NY-140007, a.i. prometryn, Syngenta). For pre- and post-emergent control of broadleaf and grass weeds in carrots and cilantro.
- **MERIVON® XEMIUM® BRAND fungicide:** (EPA No. 7969-310, SLN NY-140004, a.i. fluxapyroxad + pyraclostrobin, BASF). For control of Purple blotch, Stemphylium leaf blight, Botrytis leaf blight and Botrytis neck rot, and suppression of downy mildew. **Note: Merivon will not be legal to use in New York on cucurbit, leafy and root vegetables until new product labeled with the container label with the NY restrictive language is in the channels of trade, which is projected for Spring 2016.** It also has a SLN label for use in pome and stone fruits.

**Note: Users must have a copy of both the approved SLN 24 (c), 2(ee) or supplemental label, and NY-stamped primary label in their possession at the time of application.**

### Discontinued Products

- **DI-SYSTON 8 Insecticide:** (EPA No. 264-734, a.i. Disulfoton, Bayer CropScience). The last registered use on lettuce expired on **December 31, 2014**. It is illegal to use this product in New York.
- **RO-NEET herbicide:** (EPA No. 74530-16; a.i. cycloate; Helm Agro). For pre-emergent control of broadleaf and grass weeds in garden beets and spinach. **End use date of 9/30/2015.**
- **THONEX 3EC & 50W Insecticide** (EPA No. 66222-63(EC), 66222-62(W), a.i. endosulfan, MANA Crop Protection). For broad-spectrum insect control. It is unlawful to use endosulfan on broccoli, Brussels sprouts, cabbage, carrots, cauliflowers, celery, collard greens, cucumbers, dry beans, dry peas, eggplant, kale, kohlrabi, lettuce, mustard greens, summer melons, summer squash, greenhouse tomatoes, sweet potato and turnip. **Crops/Uses with a stop use date of July 31, 2015:** peppers, potatoes, pumpkins, sweet corn, tomato, and winter squash. **Crop Uses with a stop date of July 31, 2016:** Brassica vegetable crops grown for seed.

### In short supply:

- **VYDATE L and C-LV Insecticide/Nematicide:** EPA No. 352-532 & 352-372, a.i. oxamyl, DuPont). Product is not currently being produced due to a deadly incident that occurred in the Texas plant where Vydate is produced. ●

## How to LOOK UP LABELS

for  
Pesticides Labeled  
in New York



Go to the website of the NYS Pesticide Product, Ingredient, and Manufacturer System (PIMS):  
<http://pims.psur.cornell.edu/>

To look up primary and supplemental labels that are **currently registered**, you may search by product name, active ingredient or EPA number. From the product search results, click the “NYS” label under the “label” column of the pesticide that you are interested in and from the next page, click “view” of the most recent (by date) primary or supplemental label. Often, but not always, **Section 24C Special Local Needs and 2(ee)** labels will be available via this search.

If you want to check and see if a **pesticide has been deregistered**, when searching by product name or EPA number, under “search options”, select “archive”.

To look up **Section 18 Emergency** labels, from the main search menu, click on “Special registrations”. From this screen, scroll down to the “NYS 2 (ee), FIFRA Section 18” section and click on “NYS Emergency Exemptions (FIFRA Section 18s). A list will come up and you can click on the label directly from this screen to view the label as a pdf. **Special Local Needs 24(c)** labels can be looked up under “Special registrations” as well. ●

# Preventing Seedling Diseases in the Greenhouse

Daniel S. Egel, Plant Pathologist, Purdue University Extension

Diseases that are likely to affect vegetable transplant production fall into two types: damping-off diseases caused by soilborne fungi and transplant diseases usually associated with fungi or bacteria which survive with seed or plant residue. Both types of diseases can cause extensive transplant loss. This bulletin briefly describes both types of diseases and appropriate measures for their control.

## DAMPING-OFF DISEASES

Damping-off is a disease that can affect almost all vegetable plants at the earliest stages of growth. It occurs in home gardens as well as commercial fields and greenhouses, and may be caused by several soilborne fungi. Losses due to damping-off can be severe and often appear as reduced stands in seed flats or rapid wilting and death of young seedlings. Prevention is the key to control damping-off and can be achieved by several methods.

**Symptoms:** Damping-off may occur before or after seedlings emerge from the soil. In the case of pre-emergence damping-off, fungi infect seeds as they germinate. As infection progresses, seeds rot and eventually disintegrate. As a result of pre-emergence damping-off, poor stands become apparent days or weeks later.

Post-emergence damping-off is most often observed in seed flats or among transplants. Fungi infect stems at or near the soil surface. The affected area of the stem takes on a water-soaked appearance and sometimes becomes constricted. Eventually, the stems are unable to maintain structural support of seedlings, which usually collapse and die within 24 to 48 hours.

In some cases, seedlings survive infection in seed flats or as young transplants and are planted in the field. Such plants are likely to exhibit a "wirestem" symptom characterized by an off-color, twisted and constricted stem. This symptom is especially evident in infected crucifer seedlings and results in substantially reduced yields.

**Cause:** Damping-off is most often caused by any or all of three groups of fungi, namely Pythium, Rhizoctonia, and Fusarium. Species of genus Pythium are especially destructive in commercial vegetable plantings. Any temperature which is unfavorable for plant growth may cause increased damping-off development.

## SEEDBORNE/RESIDUEBORNE PATHOGENS

One or more diseases of this type affect most vegetable crops. The pathogens (disease causing microorganisms) which cause these diseases survive in seeds or plant residues, not in soil mixes.

**Symptoms:** Outbreaks of these diseases often show up as clusters of diseased plants. Symptoms on leaves often include brown lesions with yellow halos. In contrast, environmentally induced problems often occur uniformly throughout the seedlings or only in one location (for example, close to an outside wall).

**Cause:** Several different fungal or bacterial pathogens may be introduced into a transplant facility via contaminated seed (Table 1). Once introduced, these pathogens may continue to cause problems year after year if proper precautions are not taken.

**Table 1.** Vegetable crops frequently grown as transplants and diseases most often observed on the seedlings. The pathogens that cause these diseases may be borne on the seed.

Vegetable crop	Disease
cabbage	black rot Alternaria leaf spot
cucumber	angular leaf spot
muskmelon	anthracnose gummy stem blight
pepper	bacterial spot
tomato	bacterial canker bacterial speck bacterial spot
watermelon	anthracnose gummy stem blight watermelon fruit blotch

## SEEDLING DISEASE CONTROL

**Control of damping-off diseases:** Losses attributed to damping-off can be reduced by preventing contamination of soil mixes and manipulating the environment so that seedlings escape infection. The fungi associated with damping-off thrive in a wet environment. Therefore, the disease is usually apparent where excess soil moisture exists. Also, poor sunlight and other conditions such as excess nitrogen fertilizer, which inhibits seedling maturation, are favorable for disease development. Cultural control usually involves any treatment which hastens stem maturation and discourages pathogen development. Control recommendations include the following:

- Use **uncontaminated** soil mix. Home gardeners and commercial growers alike are advised to use a commercially prepared soilless growing mix that is sold in 3-4 cu ft. bales or bags. A common mistake is to open a bag of "clean" soil mix and place it on a dirty floor or some other unclean surface prior to planting. Remember, your soil is only as clean as the dirtiest surface that it has come into contact.
- Plant seeds shallow and in warm soil.
- Use soil mixes that drain well.

continued on next page



- Balance nitrogen and potassium fertilizer properly with adequate phosphorus to hasten maturation (NPK 1:2:1). Excess nitrogen promotes seedling growth and succulence rather than maturation.
- Chemical seed treatment: Almost all commercially available vegetable seeds are sold already treated with a fungicide. The fungicide should help kill pathogens in the immediate vicinity of the seed for approximately two weeks. Chemically treated seeds, however, are no substitute for the preventative measures discussed here.
- looking seedlings before a possible disease problem develops.
- Seedlots should be separated from one another, for example, by a piece of wood tall enough to prevent the spread of diseases from one seed lot to another. Save all information regarding seed purchases.
- Irrigate in the morning to ensure drying of soil and leaf surfaces.
- Growers interested in treating transplants with fungicides/bactericides should check the label for specific mention of greenhouse use.
- Growers should use good sanitation. The following section outlines sanitation measures that can help reduce the incidence of both damping-off and seedborne/residue-borne pathogens.

**Control of seedborne/residue-borne pathogens:** Several measures should be taken to minimize or prevent the introduction of a seedborne/residue-borne pathogen into a transplant facility.

- Since many diseases may be seedborne, avoid saving seed unless specifically trained and equipped for seed production.
- Frequently inspect seedlings as they are growing. Once established, diseases can rapidly move through a greenhouse. Remove suspicious

ings are better than dirt floors. Dirt from the floor can be splashed onto the foliage of seedlings or the roots may contact the dirty floor, leading to disease. Plastic/cloth coverings have the advantage that they can be cleaned or replaced.

- Transplants may be raised off the greenhouse floor onto wooden pallets or cinderblocks. Such a precaution lessens the chance of contamination from the floor, keeps the growing temperature warmer, and facilitates drainage.
- Transplant flats should either be new or cleaned before each transplant generation. Trays should be cleaned to remove soil and plant residue and then treated. There are several disinfectants available for use in disinfecting transplant trays (e.g., Greenshield, Physan 20, household bleach). I have found little difference between using Greenshield, Physan 20, or 10% household bleach for 10 minutes to disinfect polystyrene transplant trays. Be certain to follow label instructions including wearing gloves and eye protection. 🍅

**General control measures:** Since the fungi or bacteria which cause plant disease must survive in soil, soilless mix, or plant residue, it makes sense to keep transplant facilities and materials as clean as possible. The following suggestions should help avoid all types of seedling diseases.

- Gravel or plastic/cloth floor cover-

## On-Farm Demonstration of IPM in Sweet Corn

Marion Zuefle, NYS IPM

Integrated pest management (IPM), which aims to reduce pests while minimizing risks to human health and the environment, was demonstrated in sweet corn at three farms in 2014. Farms were located in Ontario County, Oswego County and Steuben County. Growers agreed to set portions of their fields aside and let IPM practices decide when and how to best manage pests.

Pheromone traps were set-up at each of the three farms to monitor the flight of 5 corn pests: European corn borer E and Z race, corn earworm, fall armyworm and Western bean cutworm. Sweet corn fields were also scouted weekly to determine insect and disease pressure. The combined information from weekly pheromone trap catches and scouting reports was

used to make weekly management recommendations to growers. Growers followed these recommendations on the IPM-managed portions of their fields.



Scouting sweet corn.  
Photo: Marion Zuefle, NYS IPM

To determine if IPM practices were an improvement to the growers' standard practices, corn from the IPM-managed field was compared to corn from the

grower-managed field at time of harvest. For all three farms the average percent damage at harvest from IPM-managed fields was less than that from grower-managed fields, with most fields having less than 5% damage. Scouting and timing sprays more effectively also reduced total insecticide sprays.

By using IPM a grower can reduce the use of pesticides while still maintaining a high quality crop. To view the full report please see: [Fresh Market Sweet Corn IPM on Farm Demonstrations](#) 🍅

## UPCOMING EVENTS *view all Cornell Vegetable Program upcoming events at [cvp.cce.cornell.edu](http://cvp.cce.cornell.edu)*

### Webinars for Farmers Markets Using a Token System for SNAP

May 5, 2015 | Noon - 1:30 PM

May 21, 2015 | Noon - 1:30 PM

The Farmers Market Federation of NY will be holding free webinars for farmers markets who will be using a token system for SNAP (Supplemental Nutrition Assistance Program). The webinar training is mandatory for all markets using this system that have not previously participated in training. For all others, the webinar is a refresher course. To register for these webinars, click [here](#) for the registration information. For more information, contact the Farmers Market Federation of NY at 315-400-1447 or email [deggert@nyfarmersmarket.com](mailto:deggert@nyfarmersmarket.com).

### From Tillage to Drainage: Working with Your Farm's Diverse Soils

May 14, 2015 | 4:00 - 7:00 PM

Mud Creek Farm, Cherry St, Victor, NY 14564 (just off Route 44, past Ganondagan and The Apple Farm)



Unlock the long-term potential in the soil on your farm! Whether bringing new acres into production or renovating your existing fields, there is plenty to be done to provide for optimum soil fertility and to properly incorporate infrastructure like irrigation and drainage. Hear from Ruth Blackwell about Mud Creek Farm's existing soil health management as Cornell Cooperative Extension's Crystal Stewart adds insight about techniques for making most of the soil and land. Farmers of all experience ranges and land situations will be able to apply the day's lessons about creative cover cropping, testing soil health, management practices based on soil type, fertility practices, soil microbiology, conservation practices, and infrastructure back to their own soils.

To pre-register and pay, shop [online](#) or call Stephanie at 585-271-1979 ext. 509. The fees are \$15/person or \$25 for two or more people/farm. Pre-registration is encouraged and closes at 4pm on 5/12/15. *This event is produced by NOFA-NY, in partnership with Cornell Cooperative Extension, and with support from USDA-Risk Management Agency.*

### Fresh Market Vegetable Weed Management Field Days: Cultivation Options

June 22, 2015 | 4:00 - 7:45 PM

Fenton's Produce LLC, 3323 Pratt Rd, Batavia, NY 14020



Research and Extension Educators will be leading demonstrations and answering questions on cultural and mechanical weed management options for fresh market vegetable growers. Attendees will see demos of new cultivation equipment in vine crops, beans, cabbage, and lettuce. Growers will learn what equipment is right for their farm and how to set-up (common equipment sweeps/shanks). CCA and DEC credits will be available. [Register and pay online](#), or 716-652-5400 and pay at the door. For more info, call Darcy Telenko at 716-697-4965.

### Fresh Market Vegetable Weed Management Field Days: Weed Management in Vegetable Production

June 23, 2015 | 8:30 AM - 3:30 PM

CVP Weed Management Demo Site at Partridge's on the Farm Market, 4924 Ellicott St Rd (Rt 63), Batavia, NY 14020



Research and Extension Educators will be leading demonstration site tours and answering questions on cultural and mechanical weed management options for fresh market vegetable growers. Equipment options and considerations will be discussed and industry representatives will be on-hand to comment on their products.

#### Topics:

- Weed Management Between the Rows
- Weed Identification and Biology
- Tillage Options for Weed Management
- Essential Weed Management Equipment for the Beginning Farmer
- Herbicide Options in Sweet Corn
- Herbicide Injury Demo
- Perennial Bed Row Cover

CCA and DEC credits will be available for portions of the day. [Register and pay online](#), or call 716-652-5400 and pay at the door. We request pre-registering for the event so that we have a lunch count. For more info, contact Darcy Telenko at 716-697-4965.

### Crop Quality Control on Small-Scale Organic Farms & High Tunnels

July 8, 2015 | 3:00 - 6:00 PM

Falkimmer Farms Organic Growers, 8595 E Eden Rd, Eden, NY 14057



Tour several acres of cultivated fields to learn how the Falkowskis produce quality organic produce, and market it through direct-to-consumer opportunities. Cornell Vegetable Program Specialist Judson Reid will lead a demonstration and discussion of tomato pruning and other high tunnel production practices that improve quality, especially in organic systems. There will be time to network and ask questions, and bring a dish to pass for the potluck at the end of the event! To pre-register and pay, shop [online](#) or call Stephanie at 585-271-1979 ext. 509. The fees are \$15/person or \$25 for two or more people/farm. Pre-registration is encouraged and closes at 4pm on 7/6/15. *This event is produced by NOFA-NY, in partnership with Cornell Cooperative Extension, and with support from USDA-Risk Management Agency.*

## Are Your Veggies Gluten-Free? Think Again!

Julie Kikkert, CCE Cornell Cooperative Extension

Processing pea growers in western New York were caught unaware last year by the new requirement that their fields must be free of volunteer wheat and small grains, and unfortunately some fields were by-passed. This is likely the beginning of a trend amongst vegetable processors and buyers. While vegetables are inherently gluten-free, new federal standards now require no more than 20 ppm of gluten in any product labeled as such (FDA.gov). The 20 ppm standard is the lowest level that can be consistently detected in foods using valid scientific analytical tools. Gluten is a mixture of naturally occurring proteins found in wheat, rye, barley and crossbreeds of these grains. Health problems in humans include celiac disease, wheat allergy, gluten intolerance and gluten sensitivity. There is a large worldwide market for products labeled gluten-free.

Vegetable growers should take care to minimize volunteer small grains in their fields so as not to contaminate the product. Different strategies can be used depending on the size of your farm. The pre-plant incorporated herbicides, Treflan and Eptam will suppress small grains. Similarly, Dual Magnum applied pre-emergence, will provide suppression. Post emergence applications of Select Max (12 fl. oz) and Assure II (8 fl. oz) will control wheat that is 2 – 6 inches tall, while Poast (1.5 pt) will control wheat up to 4 inches tall. ●

## Grants for Processing Crops Research Awarded

Julie Kikkert, CCE Cornell Vegetable Program

The New York Vegetable Research Association and Council awarded a total of \$127,688 for 9 research projects. The funds for these grants are contributed by the growers and processors through the processing contracts. The following projects were awarded for 2015:

Researchers	Title	TOTAL
Bellinder	Weed Management Research for Sweet Corn, Peas, Snap and Lima Beans, Beets, and Carrots	\$40,308
Kikkert	Slugs in Processing Peas	\$4,784
Nault	Cropping Practices and Landscape Factors Associated with European Corn Borer Populations: Implications for Improving Management in Sweet Corn and Snap Bean	\$16,000
Pethybridge	Efficacy of Fungicides for the Management of Foliar Diseases of Table Beet in NY	\$7,800
Pethybridge	Epidemiology and Management of Diseases Affecting Lima Bean in NY	\$7,800
Pethybridge	Efficacy of Fungicides for the Management of White Mold in Processed Snap Bean in NY	\$19,133
Reiners, Ballerstein	Processing Pea Variety Trials	\$7,000
Reiners, Ballerstein	Processing Snap Bean Variety Trials	\$13,255
Reiners, Ballerstein	Processing Sweet Corn Variety Trials	\$11,608
TOTAL AWARDS		\$127,688

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# VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

## VEGEdge

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VegEdge is the award-winning newsletter produced by the Cornell Vegetable Program in Western New York. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.



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