



Alert: Monitor Vegetable Seedlings Now!

PAGE 1



Transplanting Precautions

Vegetable



High Tunnel Soil Fertility: Pounds per Acre vs. Parts per Million



2023 Vegetable **Pesticide Updates**







PAGE 6

Black Cutworm Alert: Monitor Vegetable Seedlings Now!

Julie Kikkert, Cornell Cooperative Extension, Cornell Vegetable Program

Reports of black cutworm (Agrotis ipsilon) larvae big enough to cut through the stems of seedlings were reported in field crops starting May 26, 2023 (Mike Stanyard, personal communication). Large numbers of black cutworm moths were captured in Western NY traps on May 3, 17, 23, and 30th (https://blogs.cornell.edu/nwny-dairy-livestock-field-crops/), which means cutworm larvae will likely be present throughout June. Young seedlings (preferred) and transplants of vegetable crops can be killed by black cutworm larvae, especially beets, carrots, cucumber, leafy greens, melons, peas, potato, pumpkin, snap beans, squash and sweet corn.

Black Cutworm Scouting Tips & Thresholds

Monitor fields near any woods or weedy hedgerows that border fields. Look closely for plants that have been sheared off at ground level or areas where plants are not emerging well. There may or may not be cut leaves laying nearby. Cutworms chew young plants near the soil line and pull the plant into the ground as they feed. I've seen severely infested fields of table beets that had beautiful crop stands that seemed to disappear overnight! If you dig up the cut-off plants, you will likely find cutworms in the soil near the base of the plant or just underground. You may also see holes where the worms come in and out of the soil. The larvae are nocturnal feeders, but on rainy days you may see them coming out of their holes and feeding during the day. The larvae curl into a characteristic C-shape when disturbed.



Black cutworm larvae curled up into the characteristic C-shape lying next to a beet seedling. Photo: Julie Kikkert, CCE Cornell Vegetable Program

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.



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 Web address: cvp.cce.cornell.edu

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Information provided is general and educational in nature. Employees and staff of the Cornell Vegetable Program, Cornell Cooperative Extension, and Cornell University do not endorse or recommend any specific product or service.

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* or write to us at Cornell Vegetable Program, 480 North Main Street, Canandaigua, NY 14424.



Contents

Accumulated Growing Degree Days, 5/29/23	2
Vegetable Transplanting Precautions	3
Garlic Reminders	3
High Tunnel Soil Fertility: Pounds per Acre vs. Parts per Million	1
2023 Vegetable Pesticide Updates	5
CROP Insights 8	3
Post-Emergent Weed Control in Onion: Knocking Back and Knocking Out	9
Reusing Wooden Stakes for Crop Support 10	כ
Sweet Corn Pheromone Trap Network Report, 5/30/23 10)
Upcoming Events 11	L
Berry Office Hours 11	L
Elba Muck Donut Hour 11	L
Contact Us 12	2

The next issue of VegEdge newsletter will be produced on June 7, 2023.

Accumulated Growing Degree Days, 5/29/23

Julie Kikkert, CCE Cornell Vegetable Program

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 - May 29, 2023

•					
Location**	2023	2022	2021		
Albion	282	349	312		
Appleton	260	307	279		
Arkport	261	277	274		
Bergen	264	326	288		
Brocton	299	357	334		
Buffalo*	292	357	341		
Ceres	229	273	274		
Elba	246	315	277		
Fairville	273	331	289		
Farmington	287	334	306		
Fulton*	266	337	277		
Geneva	307	346	322		
Hammondsport	269	337	303		
Hanover	265	352	312		
Jamestown	272	302	296		
Lodi	345	408	302		
Lyndonville	274	261	292		
Niagara Falls*	311	371	289		
Penn Yan*	319	351	345		
Rochester*	302	345	311		
Romulus	299	364	319		
Sodus	319	365	331		
Versailles	285	356	302		
Waterport	270	291	263		
Williamson	249	319	257		
* Airport stations	,				

Airport stations

** For other locations: http://newa.cornell.edu

continued from page 1

Economic treatment thresholds for black cutworms have been developed for the following crops by the University of Wisconsin:

- Snap bean = 2 larvae per row foot
- Potatoes = 4 larvae per row foot
- Sweet Corn = 5% or more of plants damaged
- Leafy greens = 3% or less of the stand affected

Management

Several products are labelled in New York for the control of cutworms. Please check the label for your specific crop.

Conventional Options

Conventional growers can apply a pyrethroid, with bifenthrin recommended by Dr. R. Groves at the University of Wisconsin. Sniper LFR (bifenthrin alone) or Hero LFR (bifenthrin + zeta-cypermethrin) are labeled for cutworms on several vegetable crops including table beets and carrots in NY. According to Dr. Groves: "The bifenthrin will have the longest residual (and acute) activity of any pyrethroid. And generally yes, you will get a slight increase in residual with higher vs lower rates. If the application is made to the soil surface (predominantly) and targeting the area where cutworm larvae are residing during the day, then the bifenthrin should have a reliable 2- to 3-week residual. Especially if it were watered in as much as possible (> 0.25") immediately after application. I don't think it will be necessary for re-applications."

Organic Options

For organically grown crops, our current best thinking is that a mixture of azadirachtin and pyrethrin provides the best chance of control. Contacting the caterpillars with the spray might improve efficacy, so spraying in the late evening or night might be beneficial. While <u>Bt's (*Bacillus thuringiensis*)</u> are labeled, the caterpillars must ingest the product and it may not be very effective on large caterpillars.

Additional Information

For more information on black cutworm biology and management: https://vegento.russell.wisc.edu/pests/black-cutworm/

Vegetable Transplanting Precautions

Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

Just a quick note about transplanting precautions when it is hot and dry if going into black plastic or even the biodegradable mulches. Make sure the holes are wide enough for the transplants not to have their stems touching the edges of the mulch. The mulch gets hot in the sun and can injure the tender stems. Filling in the holes with soil can be done to keep the plants from leaning over touching the edges as well as reduce flapping in the breeze.

Transplant holes that are too deep or if the ground, ridge, or bed is uneven, there can be a significant space between the soil level and the mulch. If the wind picks up, the mulch can flap creating a bellows effect blasting the transplant with hot air causing injury. Don't rush bed preparation. Try to provide a mostly level surface to transplant into.

If using biodegradable mulches be sure to read the directions before laying these products down. Yes, read the directions! Unlike plastic, the bio-mulch needs to be put down when you are ready to transplant and not weeks in advance. The film needs a real smooth soil prep and not to be laid tight like plastic. The sun and soil moisture tightens the film. If it is put down tight then it tightens from the elements, it will tear.

Garlic Reminders

Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

As mentioned in the last issue of VE, be on the lookout for allium leaf miner. This pest is being seen in the Finger Lakes and probably moving into the far west. We want to be scouting for just in case. Check out the pictures in the last edition of VE to identify the tell-tale markings on leaves that resemble 1/8th inch white dots in a row. When the maggots hatch out, they burrow through the leaf tissue while they feed. Feeding damage looks yellowish to tan trails under the leaf surface. If symptoms like these are seen, please contact the Cornell Vegetable Program team.

Another issue for garlic is lack of water. Some areas have been dry while others have been on the wet side but with the stretch of sunny weather and high temperatures, some soils can dry down quickly. As the calendar moves closer to June 21, the leaf growth will cease and all the energy will go to bulb formation/enlargement. Garlic plants have short root systems and can struggle if the soil has dried down. Dry soils during bulb growth will reduce size. Irrigation will be needed to keep plants in good shape for strong growth. If you notice normal dark green leaves looking a little grayish, get some irrigation to those plants. Several smaller applications of moisture during the week allow for more seepage around the root zone rather than dumping on huge gallonage and most of the water running off. Having higher organic matter in the soil also helps with good water retention.

High Tunnel Soil Fertility: Pounds per Acre vs. Parts per Million

Judson Reid, Cornell Cooperative Extension, Cornell Vegetable Program

Soil-based protected agriculture combines hydroponic and field production techniques. We are using greenhouse technology to drive yield and quality. This requires higher nutrient levels, which we can mimic from hydroponic production. However, our delivery must account for existing 'banks' of nutrient in the soil, and other factors including:

- pH
- Temperature
- Organic matter
- Biology

Additional factors that influence our decisions on source and rates of nutrients include:

- Organic vs. conventional
- Bulk vs. soluble materials
- Price
- Salts

A common question then becomes how much supplemental nutrients to add. Should we take a quantitative (pounds per acre) or dilution (parts per million) approach? There are valid reasons for both approaches. Here we will use tomatoes and nitrogen to illustrate the practice and principles of soil fertilization in a protected setting.



Excess nitrogen can keep plants in a vegetative stage and delay maturity. *Photo: Judson Reid, CCE Cornell Vegetable Program*

Start with Testing

In order to initiate the conversation, we use three tests to guide our decisions on high tunnel fertility. These include:

- 1. A standard soil test, to determine nutrient status, organic matter, pH plus a supplemental soluble salts test.
- 2. An <u>irrigation water suitability test</u> with a minimum of pH, alkalinity, EC and TDS. Further water testing for nutrient values improve our interpretation.
- 3. In season <u>foliar tests</u> of the crop serve to cross check our nutrient management and allow for immediate corrections.

Nutrient Additions and pH Management

Once we have these test results, we can make decisions on nutrient additions and pH management. Nitrogen is generally assumed to be a blank slate each spring. We know that organic matter makes significant contributions throughout the season, so these levels can be factored into a total nitrogen budget.

What is a nitrogen budget for a high tunnel tomato crop in the Northeast? Cornell estimates a minimum of 100 lbs/ac demand for the full season, whereas University of Florida recommends 200 lbs/ac (both field levels). Since high tunnels have different start and end dates, soil types and varieties grown, a middle value of 150 lbs/ac is a common recommendation, potentially more for high yielding crops, or less for high organic matter soils.

To continue with the quantitative approach (using 150 lbs/ac), the next question we must ask is: Will there be a preplant application? Certified Organic growers will often choose to apply some pre-plant nitrogen for several reason.

- Many certified sources of nitrogen are in bulk form, that cannot easily be applied in season, such as alfalfa, soy, and feather meals.
- Certified Organic sources of nitrogen that are soluble are often prohibitively expensive to use as a sole source.
- Using slower release forms of nitrogen is more consistent with organic principles than fast release.

Pounds per Acre (lbs/ac) Approach

How much should be applied pre-plant? We recommend no more than 50% of the total nitrogen budget, in this case 75 lbs/ac. This is to prevent excess levels across the arc of crop growth and yield. If too much nitrogen is mineralized too quickly, the crop can become excessively vegetative, delaying maturity and reducing yield. The excess foliage promoted can also become breeding grounds for foliar diseases such as Botrytis gray mold.

Having made a decision on pre-plant applications, we now turn our attention to in-season applications of nitrogen. Assuming that drip irrigation and an injector are in place, crop demand is now estimated on a weekly basis. Taking the remainder of the nitrogen budget (either 75 or 150 lbs/ac), we can divide the amount N desired by the anticipated number of weeks the crop will be in the ground.

continued from page 5

For example, a high tunnel tomato crop transplanted on May 1 would easily have a 20 week lifespan if terminated on October 1. The arc of growth and harvest descends rapidly in the last month, so we could estimate supplying the budget over 15 weeks. This is easy math: 150 lbs/ac/15 weeks = 10 lbs/ac N per week, or in the case of a pre-plant application, 5 lbs N/ac/week.

To calculate how much fertilizer is needed to achieve this rate we need a couple key values.

- Acreage of the high tunnel (divide the square feet of tunnel growing area by 43,560)
- % nitrogen in the fertilizer by weight (for both dry or liquid forms)

Next, we divide the weekly desired rate by the % N in the product. For example, if we want 5 lbs N/ac and have a 20-20-20 fertilizer, 5 divided by 0.20 = 25 lbs of fertilizer. However, we need to multiply that value by the actual acreage being fertilized. A high tunnel that is 0.1 acres would need 2.5 lbs of 20-20-20 to achieve a weekly rate of 5 lbs actual N/ac. Alternating with clear water irrigations, growers will further divide this rate into 2-3 applications per week to create a more uniform soil status.

Parts per Million (ppm) Approach

Uniform soil nitrogen status is also the motivation for the parts per million (ppm) approach to high tunnel fertility. In this case, we are borrowing knowledge from the hydroponic world where precise rates have been determined for tomatoes at various stages of growth. The major advantage of a parts per million approach is a precision level application that allows us to get a proper ratio of nitrogen into the route zone, regardless of water demand. This contrasts with the lbs/ac approach that requires we apply sufficient water to safely deliver the N package. In heavy soils or cool, cloudy weather the crop may have a low water demand, but still need sufficient nitrogen. Applying a known ppm allows us to keep the crop fertilized properly during times of low water demand. Many sources suggest around 150 ppm pushing upward to 200 ppm N during peak demand. To calculate how much fertilizer is required to achieve this rate we need several key values.



Either a ppm or lbs/ac approach requires a proportional injector. *Photo:* CCE Cornell Vegetable Program

- The proportional ratio of our injector. Many models are fixed at 1:100, and we'll use this ratio for ease of calculation.
- Desired ppm N. 150 ppm is a safe figure.
- The % N in our fertilizer.

Now, we can use a simple formula to reach a weight of fertilizer to apply. Here we are solving for US ounces (by weight) and gallons of stock, the most common units amongst Northeast US high tunnel growers. Other units require different formulas. Our equation represents:

(ppm desired X injection ratio) / (%N of fertilizer X 75) = ounces per gallon of stock solution

For example, we desire 150 ppm N, our injector is set at 1:100 and our fertilizer is 20-20-20.

 $(150 \times 100) / (20 \times 75) = 10$ ounces of fertilizer per gallon of stock.

Now, we can apply 150 ppm N regardless of how much water we irrigate by formulating our stock solution properly. More good news! There are many online calculators that will do this math for you, and even easier, greenhouse grade fertilizers will often have a simple chart to help achieve desired ppm for a known injection ratio and % N in the bag.

Parts per million helps us avoid over fertilization and elevated electrical conductivity levels in the soil. It is particularly useful for recently transplanted seedlings with low water demand. A ppm approach does not make sense for sandy soils that leach water quickly. In this case we are wasting and losing nitrogen if we continually irrigate at 150 ppm. The same comments apply to large crops during high temperatures. The combination of water and nutrient demand can push us back to the lbs/ac approach.

Conclusion

So, now that we know how to use these two approaches, which makes the most sense for high tunnels? I suggest that both have a role. Parts per million is particularly valuable early in the season, and the precision approach can be important when looking at nutrients besides nitrogen, that can easily be applied at toxic levels. The lbs/ac approach is useful in mid-season when both nitrogen and water demand is high. By understanding both approaches we can back-calculate how many lbs/ac N we are applying in a ppm approach and vice versa. This quick math can reduce over applications and compare our progress at meeting a total nitrogen budget for the crop year. Finally, foliar samples reveal sufficient (or excess) nitrogen levels in the living crop. Now that we understand calculating daily and weekly application rates, we can fine tune adjustments based on the foliar results.

2023 Vegetable Pesticide Updates

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

Changes in pesticide registrations occur constantly and human errors are possible. Read the label before applying any pesticide. No endorsement of companies is made or implied. Information was last updated on May 31, 2023. Updates after this date may be posted in future issues of Veg Edge.

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

Federally/NYS Restricted Use status means that the pesticide is only permitted to be purchased, possessed, used, or applied by a certified pesticide applicator.

FRAC: Fungicide Resistance Action Committee

IRAC: Insecticide Resistance Action Committee

WSSA: Weed Science Society of America

Fungicide, insecticide and herbicide products belonging to different FRAC, IRAC and WSSA groups, respectively, have different modes of action. Rotation among these groups is recommended for resistance management.

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

ARCHIVE Fungicide (FRAC 11 + 12; EPA No. 100-1308; a.i.s azoxystrobin + fludioxonil; Syngenta Crop Protection). For control of post-harvest diseases including silver scurf, Fusarium dry rot, rhizopus rot and black rot in potato and tuberous corm vegetables.

BADGE X2 Fungicide/Bactericide (FRAC M1; EPA No. 10163-402; a.i.s copper hydroxide + copper oxychloride; Gowan). New liquid formulation of Badge SC (dry formulation) for control of Alternaria, Anthracnose, Cercospora, downy mildew, rust and bacterial diseases in asparagus, dry and green brans, peas, beets, carrots, crucifers (cabbage, broccoli, kale, kohlrabi, etc.), radishes and turnips, all cucurbits (cucumbers, melons, summer and winter squash), fruiting vegetables (tomatoes, peppers, eggplant), head and leaf lettuce, spinach, chard, bulb vegetables (onion, garlic, leek), potato and sweet corn. OMRI-Listed for organic use (unlike Badge SC).

BEXFOND Biological Fungicide (FRAC BM02; EPA No. 69553-9-62719; a.i. *Bacillus amyloliquefaciens* subspecies *plantarum* strain FZB42; Corteva). Bexfond is a biological fungicide targeting soil-borne diseases caused by Fusarium, Sclerotinia, Verticillium, Phytopthora, Rhizoctonia, etc. in head and stem brassicas (cabbage, broccoli, Brussels sprouts, kale, etc.), cucurbits (cucumbers, melons, summer and winter squash, etc.), fruiting vegetables (tomato, pepper, eggplant, etc.), succulent and dried peas and beans, bulb vegetables (onion, garlic, shallots, etc.), root vegetables (carrot, all potatoes, beets, radish/turnip, parsnips, etc.) and leafy vegetables (lettuce, etc.).

TESARIS Fungicide (FRAC 7; EPA No. 7960-309; a.i. fluxaproxad; BASF). Xemium[®] brand fungicide technology targeting Alternaria, powdery mildew and Sclerotinia (suppression) diseases in Brassica leafy vegetables (cabbage, broccoli, Brussels sprouts, kohlrabi, etc.), bulb vegetables (onion, garlic, leek, shallot, etc.), fruiting vegetables (tomato, pepper, eggplant, etc.), leafy vegetables (lettuce, spinach, celery, etc.) and root vegetables (beets, carrots radish, etc.). NYS-Restricted Use.

THEIA Biological Fungicide: FRAC BM02; EPA No. 94713-2-92488; a.i. *Bacillus subtilis* strain AFS032321; AgBiome). Labeled as a seed treatment, soil drench and as a foliar application in head and stem brassicas (cabbage, broccoli, Brussels sprouts, etc.), leafy brassicas (kale, mustard greens, etc.), cucurbits (cucumbers, melons, summer and winter squash, etc.), fruiting vegetables (tomato, pepper, eggplant, etc.), bulb vegetables (onion, garlic, shallots, etc.), root vegetables (carrot, all potatoes, radish, etc.) and leafy vegetables (lettuce, etc.) for control of several diseases.

Label Expansions and Supplemental Labels (new pests and/or crops added to updated version of label)

DOMARK 230 ME Fungicide (FRAC 3; EPA No. 10163-397; a.i. tetraconazole; Gowan). New version of **label expanded** to include **dried shelled peas and beans** for control of **white mold** and other select diseases.

RELY 280 Post-Emergent Burndown Herbicide (WSSA 10; EPA No. 7969-448; a.i. glufosinate-ammonium; BASF). **Supplemental label** includes pre-plant burndown application to mulch covered beds prior to transplanting and hooded row middle application (banded between rows) for post-emergent control of broadleaf and grass weeds (non-selective) in **cantaloupe, cucumber, summer squash and watermelon**.

FIFRA 2(ee) Recommendations (unlisted pest for crop already on label)

BADGE SC Fungicide/Bactericide (FRAC M1; EPA No. 80289-3-10163; a.i.s copper hydroxide + copper oxychloride; Gowan). For control of white mold in dry beans.

BADGE X2 Fungicide/Bactericide (FRAC M1; EPA No. 80289-12-10163; a.i.s copper hydroxide + copper oxychloride; Gowan). For control of **white mold in dry beans**. OMRI-Listed for organic use.

continued from page 6

ECOSWING Botanical Fungicide (FRAC BM01; EPA No. 10163-357; a.i. extract of *Swinglea glutinosa*; Gowan). For control of white mold in dry and succulent beans. OMRI-listed for organic use.

Special Local Needs (SLN)

Nothing new in 2023.

Products Being Phased Out/Discontinued/Cancelled

COMMAND 3ME PRE-EMERGENT HERBICIDE (FRAC 13; EPA No. 279-3158; a.i. clomazone; FMC). **Cabbage removed from new label.** All other previous uses including broccoli are still labeled. See April 19 issue of Veg Edge for more information.

NEONICOTINOID pesticides to be reclassified as restricted use – Effective January 1, 2023, pesticide products containing imidacloprid, acetamiprid, or thiamethoxam active ingredients that are labeled for foliar or widespread outdoor use or seed treatment will be reclassified as NYS-restricted use. A complete list of the pesticide products subject to this action can be found in the tables listed on the DEC website: <u>https://www.dec.ny.gov/chemical/298.html#NYSPAD</u>. Most of the neonicotinoid pesticides are already restricted use in New York, and this reclassification affects mostly homeowner uses, except for the seed treatments (such as Gaucho, etc.), Assail and generics (a.i. acetamiprid), and the Cruiser brand line of products (a.i. thiamethoxam).

With Restricted use status the pesticide is only permitted to be purchased, possessed, used, or applied by a certified pesticide applicator or the holder of a pesticide purchase permit. However, in certain situations restricted use pesticides may be applied by someone working under the direct supervision of a certified pesticide applicator when proper training and oversight is provided. The reclassification will ensure proper use by trained applicators, and require sales and use data to be annually reported to NYSDEC in accordance with the Pesticide Reporting Law. This will provide a practical mechanism for obtaining information on use location and amounts for products which are currently registered as "general use" in New York State and can be used by the general public.

If you have one of the listed pesticide products, they could have been possessed, used, and applied through December 31, 2022. Before January 1, 2023, you should have either: used or disposed of the product, distributed the pesticide products to a certified pesticide applicator, became a certified pesticide applicator, or obtained a pesticide purchase permit to remain compliant with the requirements of this DEC reclassification. <u>After January 1, 2023</u>, purchase, possession, distribution, or application of these pesticide products without a pesticide applicator certification or a purchase permit is illegal.

Note: Users must have a copy of both the approved SLN, 2(ee) or supplemental label, AND the primary label in their possession at the time of application. See section on how to look up pesticides labeled in New York.

How to Look Up Labels for Pesticides Registered in New York

You can find all the labelling information you need at <u>New York State Pesticide Administration Database (NYSPAD) portal</u>. It is available at https://www.dec.ny.gov/nyspad/products.

On the top of your screen, you can search by EPA registration number, Product name, or Registrant. In the Advanced Search, there are also options to search by Pesticide Use/Type, Restriction, Formulation, Registration Status, etc.

Enter the information that you are looking for and click "Search". A list of products will come up with some basic information including full product name, EPA registration number, manufacturer, and restrictions. For the product that you are interested in, click the "More" button to access a list of the active ingredient(s) and labels. All label types will be presented including primary, supplemental, 2(ee), and 24 (c) labels. The most recent label will be at the top of that list.

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CR P Insights

Observations from the Field and Research-Based Recommendations

GENERAL

See 'Vegetable Transplanting Precautions' on page 3, and 'Reusing Wooden Stakes for Crop Support' on page 10. - RH

BEETS

Beet seedlings are very susceptible to black cutworm feeding. (See the cover article on page 1.) For conventional growers, bifenthrin has the longest residual and most acute activity of the pyrethrins. Sniper LFR (bifenthrin) or Hero (bifenthrin plus zeta-cypermethrin) are labeled in table beets (separate section from root crops). See the article for organic options. – JK

CARROTS

Some carrots were lost from the frost/freeze that occurred on May 17 to 18. - JK

GARLIC

See 'Garlic Reminders' on page 3. - RH

ONIONS

Conditions are dry and irrigation has begun! The majority of the direct seeded onions are in 1.5 to 2-leaf stage, which are just a hair young for the most tolerant stage for heavy-hitting post-emergent herbicide applications to clean up weed escapes (Fig. 1). Later planted fields are in flag to various 1-leaf stages. Growers have done a great job of knocking back tiny weed escapes with low rates of Goal 2XL in order to position them perfectly for later post-emergent herbicide applications. Many fields will be getting these post-emergent herbicide applications at the 1.25-leaf and 2.5-3 leaf stages this week – see article on page x. Transplanting is almost complete with earliest plantings at 7-leaf stage and most transplanted acreage with 4-5 leaves. It is not surprising that with this stretch of hot sunny weather that onion thrips have arrived (mostly adults at this time) on transplanted and volunteer onions. Scout transplanted onions this week to check whether onion thrips pressure has reached the spray threshold of 0.6 to 1.0 thrips/leaf for the first application of Movento.

Elba Muck Donut Hour will begin next week on Tuesday, June 6 at the corner of Transit Rd. and Spoilbank Rd. in the Elba muck. All are welcome to attend this traditional outreach activity where current pest pressure and pesticide recommendations are discussed weekly throughout the growing season.



Figure 1. These onions are just waiting to grow another half to full size leaf to reach the 2.5-3 leaf stage when Buctril 2E 8 fl oz + Goal 2XL 4 fl oz may be applied to clean up ragweed (2-3"), Lamb's quarters (1-2"), pigweed (1") and Lady's thumb (1"). These weed escapes have been kept small (< 2") with early applications of Goal. *Photo: C. Hoepting, CCE*

PEAS

Black cutworms can damage newly emerged pea seedlings. See the cover article on page 1. - JK

SNAP BEANS

A concern this week is that pre-emergence herbicides will not have enough soil moisture (rain) to activate them. Irrigation can help but could cause soil crusting. From Michigan State Vegetable Crop Report 5/24/23: "It is important to have at least a half-inch of rain to activate the herbicide in order to move the product to the depth where germinating seeds are located. Here is a <u>great article from Iowa State University Extension</u> that explains the importance of soil moisture after application of preemergence herbicides. The rule of thumb is that if a field fails to receive an activating rain, consider applying irrigation within five to seven days of herbicide application." – JK

Effective Post-Emergent Weed Control in Onion: Knocking Back and Knocking Out

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

Knocking Back – First Hit

Even before it is time to kill the barley nurse crops in direct seeded onion weed seedlings that escaped pre-emergent herbicides appear. Often, you see onions in various stages of flag-leaf with a new flush of weed seedlings ranging from cotyledon stage to 1 inch in size. Often Goal 2XL 0.25-0.5 fl oz/A with or without barley-kill herbicides are used at this onion stage to burn back or kill these escapes (Fig. 1). See the May 17, 2023 issue of VegEdge (page 6) for more information on barley-kill herbicides.

Pre Treatment May 16, 2023: onions flag-leaf

Post Treatment Goal 2XL 0.5 fl oz applied when onions just starting 1st leaf, 2 days after barley-kill herbicides were applied. May 30, 2023: onions 1.25-leaf



Figure 1. "Knocking back" the weeds with early applications of post-emergent herbicides in order to keep them small enough (e.g. 1 inch or less) so that they will remain within the size limit for later applications of post-emergent herbicides when the onions are large enough to handle higher rates. *Photos: Christy Hoepting, CCE Cornell Vegetable Program*

Knocking Back – Second Hit

The second opportunity to knock back weed seedlings is when the onions are in the 1.25-leaf stage, which is when the second leaf is starting to come in and is about a quarter of the size of the first-leaf (Fig. 2).

- Chateau 2 oz/A would be the herbicide of choice when the weed spectrum includes yellow nutsedge (2 inch or less), pigweed (PW 2" or less), marsh yellowcress (MYC 2" or less), Lady's thumb (LT 1" or less), perennial sowthistle (PST) and ragweed (RW 0.75" or less). This rate of Chateau also has pre-emergent residual activity. It will not control Lamb's quarters (LQ).
- Goal 2XL 2 fl oz/A or Goaltender 2-3 fl oz/A is necessary if RW is > 0.75" and LQ are in the mix. These rates of Goal have no pre-emergent activity.
- Goaltender is a safer formulation of Goal 2XL, both on the crop and the weeds. I generally see best results with Goaltender 3 fl oz/A (equivalent rate of oxyflufen in Goal 2XL 6 fl oz but in a much safer package for the onions)
- Water volume of 40 gpa may be less injurious to onion seedlings than 20 gpa.
- Weeds and onions are tougher in warm, sunny, breezy weather, resulting in less crop injury and weed kill. Adjust rates to weather conditions.

Knocking Out

The 2.5-3 leaf stage is the most tolerant leaf stage for high rates/heavy hitting tank mixes of post-emergent herbicides. By the time onions are this big, weed escapes from pre-emergent programs may range from cotyledon stage to 4-6" in height/ diameter, especially if there were no "knockback" strategies implemented. Table 1 (on next page) provides some very general information on the ability of single application of post-emergent herbicide to kill the most common weed species in muck-grown onion.



Figure 2. Onions at 1.25-leaf stage, ready for Chateau 2 oz, Goaltender 2-3 fl oz/A or Goal 2XL 2 fl oz/A. Photo: Christy Hoepting, CCE Cornell Vegetable Program

Heavy hitters:

- Buctril 2E 8 fl oz/A + Goal 2XL 4 fl oz/A: Most effective broad-spectrum weed control, especially important for LQ and RW.
 Does not burn back YNS or PST as well as Chateau.
 - Use 40-50 gpa to improve crop safety and do not apply when onion foliage is wet/moist.
- Stinger 8 fl oz: For control of PST, which should be applied when PST is actively growing and 3-5" (mid-rosette stage).

The **risk of crop injury should always be weighed against the risk of an out-of-control weed problem.** Sometimes there are not enough weed escapes to warrant hurting the onions. Other times, injured onions are a small price to pay for excellent weed control.

Table 1. General weed size that post-emergent herbicides kill in onion, from herbicide trials conducted 2017-2019 (Hoepting).

	Maximum Size of Weed Killed						
Herbicide Treatment (single application)	PW	LQ	SW/LT	RW	MYC	YNS	PRE-emergent Activity
Chateau 2 oz	2-4"	none	0.5-1"	1" Some 2"	1-2"	2" VG burn	YES!
Goal 2XL 4 fl oz	4"	1"	1-2"	none	none	1-2" G burn	No
Goaltender 2 fl oz	1-2"	none		none	none	*	No
Buctril 2E 8 fl oz	1"	1"	1"	2-3"			Some
Buctril 2E 8 fl oz + Goal 2XL 4 fl oz	4"	1-3"	4"	3"	4-6"		Some
Buctril 2E 8 fl oz + Goaltender 2 fl oz	3"	1-2"	4"	3"	4-6"		Some

PW: pigweed; LQ: Lamb's quarters; SW/LT: smartweed/Lady's thumb; RW: ragweed; MYC: marsh yellowcress; YNS: Yellow nutsedge. *have not tested.

Reusing Wooden Stakes for Crop Support

Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

Tempted to reuse wooden stakes? Don't! Simple, right? Bacterial diseases such as canker, speck, and spot can all survive on stakes. Not just wooden stakes but any stake that has a rough surface. Disease can spread from the stakes onto the plants repeating a cycle over again year after year. If using wooden stakes, it is better to start each season with new ones for tomatoes and peppers. Reuse the old wooden ones for pole beans, holding up pea netting, or having a July 4th bonfire.

If you truly insist on reusing stakes, then you should spend some time (like now) to soak them in a disinfecting solution. To kill the bacteria lingering in the stakes, fill a tank with one part bleach (germicidal type, not laundry) to 9 parts water (assuming the NaCl concentration is around 5.2%. If higher then follow label directions for disinfecting soak). Other sanitizers can be used such as hydrogen peroxide and peroxyacetic acid (PAA) are also commonly available to use with some PAA certified organic. The stakes should stay submerged for 30 minutes. If using well water, check the pH. The water should have a near neutral pH otherwise if it is too high, chlorine products may become inactivated. Adjust the pH with something like white table vinegar.

Sweet Corn Pheromone Trap Network Report, 5/30/23

Marion Zuefle, NYS Integrated Pest Management Program, Cornell; https://sweetcorn.nysipm.cornell.edu/

This is the first report of the 2023 season. Statewide, only six sites reported this week. European corn borer (ECB)- E was caught at two sites and ECB-Z was caught at one site. The hybrid ECB was caught at one site: Hurley (2).

Degree day accumulation for ECB-E would put their development at first spring moths or first eggs for most of the sites.

WNY Pheromone Trap Catches: May 30, 2023

Location	ECB-E	ECB-Z	ECB Hybrid	CEW	FAW	wвс	DD to Date
Batavia (Genesee)	NA	NA	NA	NA	NA	NA	403
Bellona (Yates)	NA	NA	NA	NA	NA	NA	431
Eden (Erie)	NA	NA	NA	NA	NA	NA	407
Geneva (Ontario)	NA	NA	NA	NA	NA	NA	427
Hamlin (Monroe)	NA	NA	NA	NA	NA	NA	374
Leroy (Genesee)	NA	NA	NA	NA	NA	NA	401
Lyndonville (Orleans)	NA	NA	NA	NA	NA	NA	370
Oswego (Oswego)	NA	NA	NA	NA	NA	NA	337
Panama (Chautauqua)	NA	NA	NA	NA	NA	NA	365
Penn Yan (Yates)	0	0	0	0	NA	NA	419
Portville (Cattaraugus)	NA	NA	NA	NA	NA	NA	435
Ransomville (Niagara)	NA	NA	NA	NA	NA	NA	391
Stanley (Ontario)	0	0	0	0	0	0	392
Williamson (Wayne)	NA	NA	NA	NA	NA	NA	346
ECB: European Corn Borer: CEW: Corn Eanworm: EAW: Fall Armyworm: WBC: Western Bean							

ECB: European Corn Borer; CEW: Corn Earworm; FAW: Fall Armyworm; WBC: Western Bean Cutworm; DD: Degree Days; NA: not available; <u>DD: Degree Day (base 86/50) accumulation starting</u> April 1 from Climate Smart Farming

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

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