



PAGE 1



2022 Vegetable Pesticide Updates

PAGE 3



PAGE 5

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Black Cutworms Will Soon Be Feeding in Vegetable Crops



The Weed Race - Trial Notes on Spraying Small Onions with Post-Emergent Herbicides

PAGE 6

Biocontrol for Ornamentals?

Judson Reid, Cornell Cooperative Extension, Cornell Vegetable Program

The introduction of beneficial insects and mites, herein called biocontrols, is a well-known pest management technique in greenhouse vegetables. Crops such as tomatoes and cucumbers are the perfect setting for biocontrols to seek out and destroy their prey: thrips, mites, aphids and other pests. These crops have relatively open canopies that allow the biocontrols to fly or crawl freely and devour pests. Biocontrols are known to have a delay in control (when compared to conventional pesticides) but, this can work fine in vegetable crops, as these occupy greenhouse space for most of the calendar year. The sustained yield and revenue of vegetable crops justifies the long-term strategy and expense of biocontrols.

In contrast, ornamental crops, particularly spring bedding plants, have very dense canopies that restrict the movement of biocontrols. Additionally, there is a quick turnover for ornamentals, sometimes spending only 8 weeks in the greenhouse, before heading off to market. This also means a shorter, sustained revenue cycle when compared to vegetables. So, are biocontrols a waste of time in ornamentals?

Biocontrols can, and do, make sense where ornamentals are mixed in with vegetable transplants or mature crops. Why? Given the diversity of crop species in most greenhouses there aren't 'one-size-fits-all' pesticide programs (conventional or organic).



These gerbera daisies are attractive to thrips, which can then move to the adjacent tomato crop. Placing biocontrols in the 4" pots helps manage the pest population for both crops. Photo by Judson Reid, 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.



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 Web address: cvp.cce.cornell.edu

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Help us serve you better by telling us what you think. Email us at *cce-cvp@cornell.edu* or write to us at Cornell Vegetable Program, 480 North Main Street, Canandaigua, NY 14424.



Contents

Biocontrol for Ornamentals?	. 1
Accumulated Growing Degree Days, 5/23/22	. 2
2022 Vegetable Pesticide Updates	. 3
Black Cutworms Will Soon Be Feeding in Vegetable Crops	. 5
The Weed Race – Spraying Small Onions with Post-Emergent Herbicides	. 6
CROP Insights	. 8
Contact Us	10

The next issue of VegEdge newsletter will be produced on June 1, 2022.

Accumulated Growing Degree Days, 5/23/22

Emma van der Heide, CCE Cornell Vegetable Program

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 - May 23, 2022

Location**	2022	2021	2020
Albion	263	254	102
Appleton	226	224	78
Arkport	213	221	95
Bergen	240	232	109
Brocton	279	270	144
Buffalo*	273	273	140
Ceres	es 200		106
Elba	236	225	102
Fairville	254	232	117
Farmington	257	250	127
Fulton*	257	220	135
Geneva	267	261	129
Hammondsport	262	243	124
Hanover	271	249	137
Jamestown	236	242	110
Lodi	323	251	143
Lyndonville	203	238	97
Niagara Falls*	281	230	110
Penn Yan*	271	279	130
Rochester*	263	250	120
Romulus	281	257	145
Sodus	278	267	110
Versailles	274	239	136
Waterport	212	206	87
Williamson	243	203	103

* Airport stations

** For other locations: <u>http://newa.cornell.edu</u>

Biocontrols don't require a license to apply and have no re-entry or pre-harvest intervals. Are we 'shipping out' a large number of biocontrols when the ornamentals make their way to market? Yes, but this can be viewed as a positive for the consumer, as there will hopefully be lingering biocontrols to keep pest populations in-check further into the season.

Biocontrols are also increasingly packaged in ways that work for ornamentals. For example, 'lollipop' style delivery of thrips predators in hanging baskets. In these situations, individual sachets of thrips predators such as *Amblyseuis cucumeris* are placed in each basket, or within benches of 4" potted materials (see photo on page 1). Since these ornamentals are often adjacent to or above vegetable crops such as tomatoes, the biocontrols will protect this crop too.

Where to Start?

First identify the common pests from previous seasons, or those most often associated with particular ornamentals. This will allow us to choose the best biocontrols and delivery method. Thrips and Two Spotted Spider Mites are common pests, and effectively controlled with predatory mites such as *A. cucumeris* or *A. californicus*. These biocontrol species crawl, not fly, to find and devour the pest. Considering the dense foliage of petunias or calibrachoa, it is important to place the biocontrol directly in the containers. To keep this economical, small quantities are used. Growers in the Cornell Vegetable Program region report that a staggered release over 2-4 weeks has provided sustained control of mites and thrips.

Other biocontrols fly to seek out pests in a greenhouse, which means that there is less packaging and distribution concerns. For example, *Aphidoletes aphidimyza*, is a gall-midge whose larvae are generalist predators of a wide range of aphid species. The adult seeks out colonies of aphids and then lays eggs in those hotspots. With this mobility, a single unit of *A. aphidimyza* could control aphids in an entire greenhouse! The biocontrol can find the aphids regardless of their distribution between vegetable and ornamental crops.

Reach out to Elizabeth, Judson, or Robert for suggestions on biocontrol suppliers. And most importantly...start early!

2022 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. Other pesticide updates that we missed are welcome. Information was last updated on May 24, 2022. Updates after this date may be posted in future issues of VegEdge.

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.)

LUNA FLEX Fungicide: (FRAC 3 + 7; EPA No. 264-1218; difenaconazole and fluopyram; Bayer CropScience). For control of Alternaria, Stemphylium leaf blight, Botrytis, Cercospora, Sclerotinia, powdery mildew, black mold, pink root, Anthracnose, Plectosporium, Septoria, Gummy stem blight, etc. in head and stem brassicas (cabbage, broccoli, cauliflower, etc.), bulb vegetables (onions, garlic, shallots, etc.), carrots, cucurbits (melons, summer squash, cucumbers, pumpkins & winter squash), dried beans and fruiting vegetables (tomatoes, peppers, eggplant, etc.). Restricted use in NYS.

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

AGRI-MEK SC Miticide/Insecticide: (IRAC 6; EPA No. 100-1351; a.i. abamectin; Syngenta Crop Protection). Label expanded (previously supplemental label) to include dried and succulent shelled and edible podded beans and peas for control of *Liriomyza* leafminor and spider mites. Federally and NYS Restricted Use.

HOWLER Biological Fungicide: (FRAC BM02; EPA No. 91197-3-92488; a.i. *Pseudomonas chlororaphis* ssp. *aurantiaca* strain AFS009; AgBiome Innovations Inc). Label expanded to include **artichoke and asparagus** for Alteranria, Anthracnose, Botrytis, Bacterial canker, Fusarium, Phytophthora, Pythium damping off, Rhizoctonia. May be applied to foliage and to soil. Other new pathogens added to the label include downy mildews, powdery mildews, Septoria, Gummy stem blight and rusts. **OMRI-listed.**

continued on page 4

ORONDIS GOLD Soil-Applied Fungicide: (FRAC 4 + 49; EPA No. 100-1614; a.i. mefenoxam and oxathiapiprolin; Syngenta Crop Protection). Label expanded to include **asparagus** for Phytophthora.

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

HARVANTA Insecticide: (IRAC 28; EPA No. 71512-26-88783; a.i. cyclaniliprole; Summit Agro). Reduced rates from 10.9 to 16.4 oz/A to 5.5 to 10.9 oz/A for control of Colorado potato beetle in potatoes and other tuberous and corm vegetables. https://summitagro-usa.com/wp-content/uploads/2021/06/ Harvanta-2ee-on-Potatoes.pdf

HERO Insecticide: (IRAC 3A + 3A; EPA No. 279-3315; a.i. bifenthrin + zeta-cypermethrin; FMC Corporation Ag Products Group). Added control of **cabbage and seedcorn maggots in head and stem brassicas (cabbage, broccoli, cauliflower, etc.)**. Federally and NYS Restricted Use.

MUSTANG MAXX Insecticide: (IRAC 3A; EPA No. 279-3426; a.i. zeta-cypermethrin; FMC Corporation Ag Products Group). Added control of **cabbage and seedcorn maggots in head and stem brassicas (cabbage, broccoli, cauliflower, etc.)**. Federally and NYS Restricted Use.

Special Local Needs (SLN)

STINGER Herbicide: (WSSA 4; EPA No. 62719-73/SLN-220001; a.i. clopyralid; Corteva AgriScience LLC). For use in **dry bulb onion for control of perennial sowthistle**. You assume all risk of crop injury, crop yield reduction, and crop loss. NYS Restricted Use.

Products Being Phased Out/Discontinued/Cancelled

a.i. CHLORPYRIFOS Insecticides for Food and Feed Uses Canceled July 31, 2021. Eg. Tradename Lorsban and generics (Warhawk, Whirlwind, Yuma, etc.) were cancelled in New York on July 31, 2021 and nationally on February 28, 2022. These pesticides can no longer be sold, distributed, or used in New York State or on food and feed sold in the United States. In addition, these canceled pesticides cannot be stored after the manufacturer's container has been opened.

GRAMOXONE SL 2.0 Herbicide: (WSSA 22; EPA No. 100-1431; a.i. paraquat dichloride; Syngenta Crop Protection). After December 31 2020, only packaging with closed systems will be allowed. Gramoxone SL 2.0 2.5 gal jugs are not a closed system. Gramoxone SL 3.0 2.5 gal jugs with closed system packaging were introduced mid-2021, and all Gramoxone SL 3.0 2.5 gal jugs are closed-systems. Gramoxone products currently in the marketplace include:

- Gramoxone SL 2.0 2.5 gal jugs registration date 11/18/2019 (new product): Not a closed system. Label has requirements for 1) EPA paraquat training, and 2) Certified Applicator license for mixers, loaders, applicators and clean-out.
- **Gramoxone SL 2.0** 2.5 gal jugs registration date 4/5/2017 (old product/label): Does not require additional training and licensing. Applicators can operate under supervision of a Certified Applicator. However, if you buy and

mix new product with old product, all applications are required to adhere to the standards of the newest label (EPA training and only Certified Applicators).

CERTIFIED APPLICATOR TRAINING

Applicators must complete an EPA-approved paraquat training listed on the the following website:

https://www.epa.gov/pesticide-worker-safety/paraguat-dichloride-training-certified-applicators

The training must be completed a minimum of every three years.

(Located on page 2 of label just above the Precautionary Statements)

 Gramoxone 3.0 Bulk. There are bulk tanks filled with the new 3.0 which has i) the higher a.i. load (3lbs vs 2lbs) and ii) does have the new language requiring online training and certified applicator licensing for a user.

Everyone is encouraged to complete the EPA paraquat required training now and to have appropriate personnel obtain the Certified Applicator license since there will be a mix of brands/labels in the market in 2022. The required EPA training for Gramoxone is good for three years.

NEONICOTINOID Pesticides to be Reclassified as Restricted Use

Effective January 1, 2023, pesticide products containing imidacloprid, acetamiprid, or thiamethoxam that are labeled for foliar or widespread outdoor use or seed treatment will be reclassified as 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/</u> <u>chemical/298.html</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 can be possessed, used, and applied until December 31, 2022. However, before January 1, 2023, you must either: use or dispose of the product, distribute the pesticide products to a certified pesticide applicator, become a certified pesticide applicator, or obtain a pesticide purchase permit to remain compliant with the requirements of this DEC reclassification. After January 1, 2023, purchase, possession, distribution, or application of these pesticide products without a pesticide applicator certification or a purchase permit will be illegal.

Note: Users must have a copy of <u>both</u> 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 Services News Government Local Q Search New York State Pesticide Administration Database (NYS-Nature Prevent & Control Polls Re s & Lei Sei PAD) portal. It is available at https://www.dec.ny.gov/ nyspad/products?0. Bureau of Pesticides Management - Information Portal ± Export Results + Home On the top of your screen, you can search by EPA reg-Products istration number, Product name, or Registrant. In the Product EPA Replatration Number Advanced Search, there are also options to search by Product Name: or For Pesticide Use/Type, Restriction, Formulation, Registration Status, etc. Q Search OR Showing 1 - 4 out of 4 Products Enter the information that you are looking for and click OMNI BRAND PARAQUAT Over EPA Reg. No. 5905-637. Registrant "Search". A list of products will come up with some trictions Federally Rastricted by EPA LI Use Yes tos REGISTERED Type HEREICIDE basic information including full product name, EPA PARAQUAT 43.2% SL C Nore registration number, manufacturer, and restrictions. For estructions Federally Restricted by EPA LI Use Yes tatue REGISTERED Type HEREISIDE the product that you are interested in, click the "More" PARAQUAT CONCENTRATE () Nora button to access a list of the active ingredient(s) and la-Restrictions NYSDEC 326-2(a), Federally Restricted by EPA Status REGISTERED Type HERBICIDE, DEFOLIANT bels. All label types will be presented including primary, WILLOWOOD PARAQUAT 3SL EPA Reg. No. 87299-35. Registrant WILLOWOOD LLC Restrictions WIDDEC 334-3(a), Referally Restricted by EPA Status REGISTERED Type HERBICIDE, DEPOLIANT supplemental, 2(ee), and 24 (c) labels. The most recent ID More label will be at the top of that list. LT Use Yes

Black Cutworms Will Soon Be Feeding in Vegetable Crops

Julie Kikkert, Cornell Cooperative Extension, Cornell Vegetable Program

Significant trap catches of black cutworm moths were recorded in our region starting April 27th and are continuing (M. Stanyard, CCE NWNY Field Crops Specialist). There have been enough growing degree days for egg hatch and we are nearing the stage where larvae will begin feeding and cutting crops. With continued moth flights happening this week, we will likely see feeding through most of June.

Black Cutworm (Agrotis ipsilon):

The larvae feed on newly emerged vegetable crops and often clip many young plants at or below the soil line each night. Crops grown from seed are more prone to damage than transplants. According to R. Groves, Univ. of Wisconsin-Madison, **susceptible crops include beets, carrots, cucumber, leafy greens, melons, peas, potato, pumpkin, snap beans, squash, and sweet corn**.

Scout 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 sever young plants near the soil line and pull the plant into the ground as they feed (see photo on page 9). Severely infested fields last year had beautiful stands of beets 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 moths fly up from the south and lay their eggs on weeds near field borders. The larvae then crawl to the crop field. Thus, damage can typically be seen near field borders. The best control is to apply an insecticide along the edges of the field where the caterpillars are feeding. It is usually not worthwhile spraying the entire field; however, if cutworm damage is detected deeper within fields, then the entire field could be treated. In a perfect world, insecticides would be applied in late evening or at night so that the chemical would directly contact the caterpillars.

The Weed Race – Trial Notes on Spraying Small Onions with Post-Emergent Herbicides

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

Around the time of killing the barley nurse crops in onion is when we often see weed escapes poking through. In my trials, I have applied herbicides to very young onions to halt these escapes from becoming uncontrollable weed problems. In my experience, the 2.5-leaf stage is the safest stage to apply heavy rates of post-emergent herbicides such as Buctril 2E 8 fl oz + Goal 2XL 4 fl oz, which can kill most weed species 3 inch in size or less. The problem is that weed escapes that occur when onions are in flag-leaf to 1-leaf stage will grow to be larger than 3 inches by the time that the onions reach 2.5-leaf stage, so they need to be killed or held back now. Below are notes from several of my onion herbicide trials. They refer to single applications. If after 7 days, the weeds are not dead and the onions can handle more herbicide, I usually make a second application, which usually does the trick.

Adding Goal 2XL 0.25 – 0.5 fl oz/A with Barley-kill Herbicides (Select EC or Fusilade and generics).

Last week, I applied Goal 2XL 0.5 fl oz with Select EC 12 fl oz + COC 0.5% v/v + Outlook 13 fl oz + Prowl EC 2 pt to onions that were in flag-leaf with 1st true leaf just starting. Within days the weed escapes in cotyledon to 1-inch stages were either dead or burned (no new growth), compared to 1-2" weed escapes in the untreated (Fig. 1). The crop oil and the greasy/oily formulations of Select, Outlook and Prowl "heated up" the low rate of Goal. It also hastened barley kill. The onions had some necrotic spotting and may have been set back a little bit, but it was worth it for the weed control. Goal 2XL 0.5 fl oz + COC 0.5% v/v could



Figure 1. In a trial, these onions were at the flag/1st leaf start stage when Select EC 1 pt + COC 1% v/v (left) and Goal 2XL 0.5 fl oz/A was added to barley-kill tank mix (Select EC 12 fl oz/A + COC 0.5 % v/v + Prowl EC 2 pt/A + Outlook 13 fl oz/A) (right). Photos were taken 6 days after these applications were made. Weeds (mostly pigweed) in cotyledon to 1 inch were dead (yellow circles) (right), and onions had minor necrosis (blue circles). Where no Goal was applied the weeds were fine (left). Photos by Christy Hoepting, CCE Cornell Vegetable Program



Figure 2. Flag leaves burned off at the soil line from post-emergent herbicide application applied to flag-leaf/1st leaf start growing stage of onion seedlings. The first true leaf is pulling the onion seedling through. *Photos by Christy Hoepting, CCE Cornell Vegetable Program*



Figure 3. Left: Onions in 1.25-leaf stage where the second true leaf is starting to grow. In trials, this stage is less risky for crop injury from post emergent herbicides than the 1-leaf stage (right) where the second true leaf has not started to come yet. Photos by Christy Hoepting, CCE Cornell Vegetable Program continued on page 7

be applied in a separate pass after barley-kill, if weed escapes were discovered after the barley kill application was already made. Making sure that the first true leaf was starting to come proved a buffer against onion seedling mortality, because sometimes the herbicides can burn the flag leaf right off, but when the first true leaf is there, it will pull the plant through (Fig. 2). If not, the seedling will die.

1.25-Leaf Safer than 1-Leaf

Just like with applying low rates of Goal to flag leaf onions that have the first true leaf starting to grow, when the second true leaf is starting to come on 1-leaf onions (1.25-leaf) is safer than when the onion seedling has only the flag and first true leaf (1-leaf) (Fig. 3). Post-emergent herbicides can burn the first leaf at the soil line, but when the second leaf has already started to grow, it will pull the seedling through.

CROP SAFETY OF POST-EMERGENT HERBICIDES ON 1.25-LEAF ONION (= 2ND LEAF STARTING) in order from safest to onion to causing most injury to onion							
(1) Goaltender 1 fl oz = Goaltender 2 fl oz	(2) Chateau 2 oz	(3) Goal 2XL 2 fl oz	(4) Buctril 2E 8 fl oz	(5) Goal 2XL 4 fl oz = Buctril 2E 8 fl oz + Goalten- der 2 fl oz = Chateau 2 oz + Goaltender 1 fl oz			
	~~~~						
less than 5% crop	Categories (1-3) o injury 7 days after tr	eatment (DAT)	Category (4) 5-10% crop injury 7 DAT	Category (5) 10% or more crop injury 7 DAT			

#### Weed Control

Weed abbreviations – PW: pigweed; LQ: Lamb's quarters; RW: ragweed; SW/LT: smartweed/Lady's thumb; MYC: marsh yellowcress; MSM: wormseed mustard; YNS: yellow nutsedge; BW: wild buckwheat; NS: nightshade

#### Chateau 2 oz

- Excellent on PW (may kill up to 4")
- Excellent on small mustards such as MYC, WSM (kill up to 2"; 4" too big), SM/LT (kill up to 1") and RW (kill up to 0.5-1", > 1" to big).
- Have burned up 1-2" YNS, rarely anything larger
- Weak on LQ (kill cot to 0.5", > 0.5" too big)
- Follow-up application 7 DAT improves control
- Can be "touchy": crop injury and weed control can increase considerably when conditions are wet/moist/weeds & onions are "soft" vs. when conditions are dry & weeds/onions are "tough". During current hot and dry weather, 2 oz would be necessary to control weeds.

#### Goal 2XL 2 fl oz

- This is the maximum rate on 1.25-leaf onion for crop safety in my trials
- Compared to Chateau, this rate offers a wider spectrum of weed control, but often only burns them back instead of killing them. Alternatively, Chateau will have a higher mortality rate on the weeds and sizes of weeds that it has best activity on (e.g. RW 1" or less), while those out of its spectrum (e.g. RW > 1") will not be hurt. Goal 2XL may not kill the weeds, but they will be more hurt overall.
- Broad-spectrum ability to burn back weeds can be effective at holding them back until higher rates of herbicides can be applied at 2.5-leaf stage, such as Buctril + Goal.
- Better than Chateau on LQ (kill up to 1")
- Goal 2XL 4 fl oz is too risky on 1.25-leaf onion

#### Goaltender 2 fl oz

- Is equivalent to Goal 2XL 4 fl oz
- In rate-to-rate comparisons of Goal 2XL to Goaltender, Goal 2XL results in better weed control (e.g. Goal 2XL 2 fl oz killed LQ 1" vs. Goaltender 1 fl oz killed LQ 0.5")
- Similarly, Goaltender is always safer on the onions. Therefore, a higher rate of active ingredient can be applied more safely than with Goal 2XL. I have applied Goaltender 4 fl oz (= Goal 2XL 8 fl oz) to 1.25-leaf onion, but this falls into category 4-5 for risk of injury, but the weed control is excellent.

#### Buctril 2E 8 fl oz (a.i. bromoxynil), tradename e.g. Brox 2EC, Broclean, etc.

- Best control of RW (kill 1-2", injure 2-4" pretty good)
- Similar control of MYC 4-6" as Goal 2XL 4 fl oz with less risk of crop injury
- Limited weed spectrum: failed to control LQ > 1", poor control of PW, fair control of NS.
- Best to use this active ingredient at 2.5-leaf when it can safely be tank mixed with Goal 2XL/tender for improved weed control spectrum and efficacy (kill larger-sized weeds)

## **CR** P Insights

#### Observations from the Field and Research-Based Recommendations

#### **COLE CROPS**

Flea beetles are active, moving in from the edges of fields. Overwintering in weedy areas and in crop debris, they move in from mustard weeds looking for brassicas with less of a waxy leaf. When transplanting or direct seeding leafy greens, cover with new row cover. Older used row cover usually stretches so the weave is no longer tight allowing pests to get through. Cover as soon as transplants go in – like when you are setting out plugs and reach the end of a row or bed, immediately use row cover. Have seen trays of transplants sitting in a field waiting to be loaded on a transplanter and within 20 minutes had flea beetles on them. Kaolin clay can be sprayed on young plants as a feeding barrier but repeated applications needed after rains and as the plants start to grow. – RH

Emergence of overwintering generation of cabbage maggot is 75-100% complete, which means that flies are mating and laying eggs. Brassica crops being planted now should be treated for cabbage maggot. A "booster" treatment such as Mustang Maxx 4 fl oz/A applied as a directed spray to the base of plants should be considered for crops that were planted in late-April or early-May should be considered in locations where maggot pressure is expected to be high. For much more information on cabbage maggot in the absence of chlorpyrifos, see detailed article on CVP website: <u>https://cvp.cce.cornell.edu/submission.php?id=853&crumb=crops|crops|broccoli|crop*6</u> – CH

Imported cabbage worms and diamondback moth are present in the crop, look for window panes and small round holes on the crop as indicators of young worms. Diamondbacks will dangle from a thread when disturbed. ID matters, as diamondbacks are less easily controlled - best go after those when small. Scout your cole crops for presence of worms before applying row cover! – EB

#### **CUCURBITS**

Received the first report of cuke beetles yesterday. Early zucchini and summer squash under cover are progressing well. - EB

#### LETTUCE AND GREENS

For brassica greens see Cole Crops. Seeing plenty of leaf miner activity in chard, spinach. Leaf miners are the larva of flies. Timing of control is quite difficult. Removal of infested leaves away from the area can help reduce the proximity of the next generation and offer a chance to reset your control (exclusion) methods. – EB

#### ONIONS

Earliest direct seeded onions are at 1.5 leaf stage with many fields in 1-2 leaf stage or less. Earliest transplants are in the 6-leaf stage, which is the maximum crop stage for application of post-emergent herbicide Chateau and Stinger. 5-leaf is the maximum crop stage for post-emergent applications of Buctril 2EC (a.i. bromoxynil, tradenames Broclean, Brox, etc). The dry spring has resulted in lots of weed escapes in some cases. 2.5 leaf stage is the earliest safe stage to apply high rates of post-emergent herbicides including Goal 2XL 4 fl oz, Buctril 2EC 8 fl oz +/- Goal 2XL 4 fl oz, the latter combination which should control most broadleaf weed escapes up to 2-3" in size (depending on species and conditions). Until 2.5 leaf stage, lower rates of Goal 2XL 0.25-0.75 fl oz, Goaltender 1-2 fl oz and Chateau 1-2 oz can be used to "hold back" weed escapes ideally keeping them less than 2" until higher rates can be used at 2.5 leaf stage. Chateau 2 oz/A tends to be best choice for escapes of mustards < 1", pigweed <2", ragweed < 0.5" and yellow nutsedge < 2". If there is Lamb's quarters 1" or ragweed > 1" in the mix, then Goaltender 2 fl oz/A tends to do a better job of burning back such weeds. See article on page 6 for notes from field research trials on using post-emergent herbicides in small onions. When the onions are tough from days of sunshine and wind and can tolerate higher herbicide rates, the weeds are also tougher and need higher herbicide rates to be effective. – CH

#### Mark your calendars!

June 7, 2022: Muck Donut Hour in Elba will open for the season. June 21, 2022 (most likely, not official yet): Muck Onion Twilight Meeting will be hosted by Williams Farms in Wolcott.

#### SWEET CORN

Seed corn maggot. This is another tiny fly that produces maggots that can be quite destructive to seeds as well as young plants. Eggs are laid at the soil line and hatching maggots burrow into the soil looking to feed on seeds. They will also burrow through stems at or just below the soil line. If seeds aren't germinating or young transplants are stunted or dying, check for signs of small holes in the seeds or stems. Seed corn maggots are generalist feeders. They may already be in the soil when planting in early to mid-spring. Row covers aren't as affective in fields where maggots are already present. Check your planting records from the previous years to see if you had problems in previous years with poor germination or loss of seedlings/transplants in that area. Postpone early planting in those areas. Warmer soils are less favorable to seed corn maggots. If damage is severe enough to replant, wait a week or so before seeding/transplanting in the same plot. Seed

continued on page 9

corn maggots after a week or two of feeding will pupate and adult flies will emerge. As the weather warms the soil, maggot damage reduces.

For chemical application products, see the Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production handbook for a complete listing, rates, and cautions. Contact your county CCE office to order a manual or go online <u>https://www.cornellstore.com/2022-PMEP-Guide-In-</u> tegrated-Crop-and-Commercial-Veg. – RH

#### TOMATOES, PEPPERS, EGGPLANT

Field planting is progressing slowly. Seeing a few cases of rhizoctonia in transplants, manifesting shortly after being set out into the field. Rhizoctonia constricts the stem just above the soil line, causing browning and eventually collapse. Roots will be discolored and lacking root hairs, but are usually not a slimy, collapsed, disintegrated mess. Trichoderma can be applied to transplants in the greenhouse preventatively. Greenhouse sanitation and keeping flats up off the ground are also preventative measures. Reactive fungicide options depend on the crop and whether plants are in the field or flats. – EB

#### continued from page 5

#### **Treatment Thresholds**

Economic treatment thresholds for black cutworms have been developed for the following crops (Univ. of Wisconsin):

- Snap Bean: 2 larvae/row foot
- Potatoes: 4 larvae/row foot
- Sweet Corn: >5% of plants damaged
- Leafy Greens: <3% of the stand affected</li>

Several pyrethroid products are labelled in New York for the control of cutworms. Please check the label for your specific crop. 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 Bt's (Bacillus thuringiensis) are labeled, the caterpillars must ingest the product and it may not be very effective on large caterpillars.

#### **More Information**

For more information on black cutworm biology and management, see: Black Cutworm | Wisconsin Vegetable Entomology



Hole in a beet row where a black cutworm larva was discovered feeding on young beets and pulling them below ground. *Photo by Julie Kikkert, CCE Cornell Vegetable Program* 

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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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