High tunnel and greenhouse growers are encountering 3 common problems this spring: damping off, high EC, and Botrytis Gray Mold.

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Got ugly onion transplants? Often this is caused by the inability of new leaves to break through the old, residual leaves at the top of the dormant set.

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Here are the highlights from the 2018 post-emergent herbicide trials in muck-grown direct-seeded onions: Buctril + Goal was the winner!

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Last summer, several populations of waterhemp survived herbicide applications in WNY corn and soybeans. Here are preliminary results of resistance tests.

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VEGEdge

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Volume 15 | Issue 08 | May 29, 2019

Photo: C. Vore

Cornell Cooperative Extension
Cornell Vegetable Program

2019 Greenhouse and High Tunnel Blues

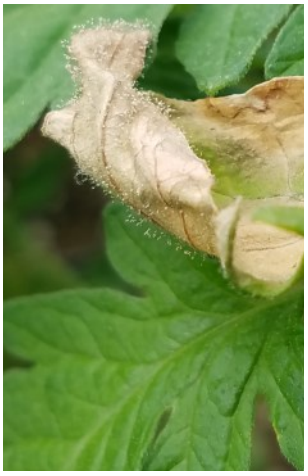
Judson Reid, CCE Cornell Vegetable Program

This spring many growers are singing the Transplant Blues. 2019 has brought a cloudy wet spring that, has not only kept transplants in the greenhouse (vs the field), has increased the humidity and foliar density within the greenhouse. These factors are behind 3 common problems: Damping Off, High EC and Botrytis Gray Mold.

With too much water and not enough sun, Damping Off is caused by the water mold Pythium. The transplants wilt, with a soft stem. To prevent this during cloudy weather, growers logically hold

Damping off of seedless watermelon.

High EC on pepper transplant roots.



Botrytis Gray Mold sporulating on tomato leaf.

Photos: J. Reid, CCE CVP

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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.

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The next issue of VegEdge newsletter will be produced June 5, 2019.

Welcome Margie Lund to the CVP

The CCE Cornell Vegetable Program (CVP) is pleased to add Margie Lund to our team of Vegetable Specialists! Margie earned her B.S. from Clemson University in Environmental and Natural Resources and her PhD in Entomology (April '19) in the Vegetable Entomology Laboratory from Michigan State University. During her PhD studies she conducted research on various vegetable crops on cooperating farms, organized extension field days, taught undergraduate lab courses and supervised scouting for invasive pests on sponsored grant research.

Margie's office will be in CCE Steuben County and she will focus on potatoes, dry beans, post-harvest handling and storage for the CVP region.

Margie Lund, new Vegetable Specialist

continued from cover – 2019 Greenhouse and High Tunnel Blues

back on water, not giving enough to run through the bottom of the tray. The continual addition of fertilizer salts without leaching causes Electrical Conductivity (EC) to rise. Since transplant season has been delayed so long this year, the fertilizer salts applied each week are accumulating more than average, burning roots off (see photo, pg 1). Botrytis Gray Mold is a ubiquitous fungus that sporulates where there is dead tissue, such as flower petals. Under the right conditions Gray Mold will infect healthy tissue.

How to cure the 2019 Greenhouse Blues? There is no further need to keep transplants inside. If fields are still too wet to transplant, move transplants out of the greenhouse to reduce the losses to Botrytis. These plants can be set on pallets or ground cover outside, as long as they are watered regularly. Speaking of water, leach through flats and pots weekly to keep fertilizer salts from building up. Leaching through reduces the EC and keeps roots healthy. Between waterings, allow transplants to dry to near wilt. This will reduce stretching, and also help reduce Damping Off.

High tunnel tomato growers are seeing major fruit losses due to Botrytis infection at the calyx, or stem connection to the fruit. Gray Mold often starts where flower petals die on otherwise healthy foliage. Spores produced here infect the moist area of the calyx. To reduce Gray Mold and Damping Off we can reduce or eliminate overhead ornamentals from vegetables, ventilate regularly, space transplants into larger pots to increase air circulation and light penetration in the canopy, irrigate in the morning to allow foliage to dry before nightfall.

For conventional fungicide options Decree 50 WDG (FRAC group 17) can be applied on transplants and greenhouse tomatoes, Luna Tranquility (FRAC groups 7+9) or Scala (FRAC group 9) for both field and greenhouse tomatoes. Serenade, a microbial fungicide, is a labeled organic spray for Gray Mold.

Botrytis ghost spots and calyx rot. *Photo: J. Reid, CCE CVP*

Fallen petal leads to Botrytis infection on pepper transplant.
Photo: J. Reid, CCE CVP

Sweet corn soon to be transplanted in Yates County. *Photo: J. Reid, CCE CVP*

Botrytis on Blossom End Rot and calyx. *Photo: J. Reid, CCE CVP*

Don't worry, the greenhouse blues always fade with time, replaced by the jazzy refrain of summer harvest.

CROP INSIGHTS

GENERAL
The ground warms and dries
Tractors rolling across fields
Finally we plant

Flea beetles seen on young kale, kohlrabi, and Asian greens in the field. Plantings under row cover have been mostly untouched. – *RH*

Despite the cool weather enough **Cabbage Root Maggot (CRM)** adults (small flies) have apparently mated, laid eggs, and hatching has occurred to now see some light damage on some brassica roots especially early transplanted cabbage. Possibly due to the wacky weather swings, the flights of adults and their life cycle may be staggered over a wider period of time this spring. If you are just getting transplants out there, be sure to have your insect management routine in place. – *RH*

Imported Cabbage Worm (ICW) pesky white butterflies seen around the brassica weeds and cabbage plantings are showing up. Be on the lookout for egg laying to begin in the coming weeks. Egg laying has been reported on brassicas in central New England already. – *RH*

Root rots, not surprisingly, have been taking its toll on a wide assortment of transplants. Some of this may be due to the obvious wet cool conditions; though some of the problem may be due to sickly transplants that were in trouble before field planting. Reusing transplant trays that hadn't been properly cleaned/sanitized, benches left dirty from last season, and overwatering in the greenhouse can all cause problems before ever getting into the field. Pay more attention to sanitation in the transplant greenhouses and management. – *RH*

FRESH MARKET ALLIUMS
Garlic mostly looks good across the region, though with the wet weather there has been some crop stress/loss due to overly saturated conditions. Check for generalized yellowing of the lower leaves, as this could indicate nitrogen deficiency. If you have a bad grass problem, sethoxydim has a 30 day pre-harvest interval and can be useful for germinated summer annual species. Check the label for adjuvant instructions specific to garlic for your formulation of this group 1 herbicide. – *EB*

BRASSICAS
Cole crops that got into the ground on time for early plantings are looking quite good. While they didn't do much in the past couple weeks, they have taken off with the warm temperatures at the tail end of last week and through the weekend. Be on the lookout for alternaria; it overwinters and we had a ridiculous amount of inoculum establish last fall. – *EB*

EGGPLANT, PEPPERS, TOMATOES
Greenhouse tomatoes: Fruit is starting to size up. This has been a tough year for botrytis – get on top of your scouting. Intercede before botrytis directly attacks your fruit (see cover article).

Field peppers are going out. Check them for aphids before transplanting. Look deep in the tiny new growth for the (usually green) aphids. Aphids are present in greenhouses, especially those that have/did have flowers. To paraphrase a colleague "aphids can be murder in peppers". So help yourself out, make sure you're putting clean plants into the field. – *EB*

GREENS
The early lettuce coming in from the field has, so far, been pretty clean and the transplants and direct seeded crops I've seen are doing well. This is good slug weather. If you have a history, your field is weedy, you are planting after turning in a (grass) cover crop, or you're on the edge of a grassy drive, you're at higher risk for slugs. Toss a small piece of wood or old shingle into the field near the edges to act as a slug indicator house. It is so much easier to scout for slugs preventatively by flipping over the indicator house than by looking for slime trails or going out very early in the morning or at night. – *EB*

ONIONS
During the end of May onion growers were able to string together more than a day of sunshine a few times and ended up getting close to planting their targeted direct seeded acreage, although more than desired went in after May 10th. Of course, transplanting continues. Transplanted fields look excellent with earliest plantings at the 8-leaf stage. Earliest direct seeded fields are at 2-leaf stage. Most of the acreage has had the barley windbreaks killed and onions are in 1-leaf stage. With exception of some stand reduction due to water-logging, stands generally look excellent. With the continuous moisture, weed control with pre-emergent herbicides has been excellent, especially in transplanted fields (Fig. 1).

Often at this time of year, it is a race between the onions getting big enough to safely apply post-emergent herbicides before the weed escapes get too big (>2") to be effectively controlled. If your weed control is good, wait until onions are at 2-leaf to apply post-emergent herbicides. Mustards and ragweed tend to be the main escapes right now as these species do well in the cooler temperatures. With all this cloudy

Figure 1. A perfect field of transplanted onions. Pre-emergent weed control is beautiful during these continuous moist conditions. *Photo: C. Hoepting, CCE CVP*

continued on next page

continued – CROP Insights

weather, weeds will likely be easier to kill and onions easier to injure, so be careful when choosing your rates. In last year's post-emergent onion herbicide trials, Buctril 2E 8 fl oz + Goal 2XL 4 fl oz was the clear winner for best weed control for a diverse array of broadleaf weeds. Buctril 2E 8 fl oz at 2-leaf has consistently been safe in all of my trials (note that I use 40 gpa and the label requires high water volume too). It appears that Goal 2XL is the major contributing factor to making this tank mix being hot. Under the hot and dry conditions last year, this tank mix was safe enough for the level of weed control that it achieved. Buctril is very good on ragweed (RW) and several mustards, but weak on Lamb's quarters (LQ), pigweed (PW) and purslane. Alternatively, Goal is very good on PW and wild buckwheat (BW), okay on LQ, and not very good on RW or mustards. So, the tank mix picks up control of a wide weed spectrum. In last year's trial, substituting Goaltender for Goal 2XL with Buctril resulted in slightly less weed control but with much better crop safety. For this year, if need be, start with Chateau as early as 1.5 leaf to clean up annual mustard and RW escapes less than 2", but only make this app when both foliage and soil surface is dry to avoid onion injury. Then, come in with Buctril + Goal at 2-leaf, using lower rates of each and Goaltender instead of 2XL for improved crop safety. After one week, if the weeds are not dead and crop injury is less than 10%, make a second application. Some growers also use 2 apps of lower rates per week. See article on highlights from 2018 POST-emergent onion herbicide trials, pg 6. Also, copies of the full reports in slide format are available from Christy.

Reminders:

- **June 3 (Tuesday morning) – Muck Donut Hour begins in Elba** at corner of Transit Rd. and Spoilbank Rd. in the Elba muck every Tuesday morning from 8:30 - 9:30 am. All welcome!
- **Onion scouting program** will start next week.
- **June 6 (Thursday morning) – Onion Crop Insurance Listening Session**, 10 am - 12 noon, CCE Wayne Co., 1581 Route 88N, Newark, NY. (See meeting announcement, pg 9.)
- **June 20 (Thursday evening) – Annual Oswego County Onion Twilight Meeting**, 4:30 pm to 7 pm. Educational program at John Dunsmoor Lake Elizabeth farm, dinner to follow at Sorbello's. – *CH*

SWEET CORN

The earliest corn planted under perforated plastic mini-tunnels is three to four leaf and the plastic is getting cut off and removed from the field. Scout these fields for European corn borer damage and watch the trap counts – the first generation is about to get active in the next week or two. Open field planted corn – I've seen anything from 2 leaf to not even close to planting due to soggy ground. – *EB*

Got Ugly Onion Transplants?

Elizabeth Buck, CCE Cornell Vegetable Program

I've seen several cases this spring where onion transplants raised from sets look very ugly out in the field. Typically they have very long, papery necks and short leaves held at narrow, upright angles. Often the case is that the new leaves could not break through the old, residual leaves at the top of the dormant set, and instead grow constricted within the papery tissue. This causes the unsightliness and also limits the amount of the leaf that is able to effectively photosynthesize. Each new leaf must take more energy away from overall plant growth in order to grow long enough to make it through the long restricted zone and out into the sun. This is undesirable in onions, as the number of leaves present at the start of bulbing (early July) is related to bulb size at harvest. It may also caused bulging or "b" shaped leaves if the new growth only partially breaks through the papery layer.

To test if this is what's going on, carefully strip down the old papery layer to "free" the new leaves underneath. No need to tear it all the way off, just open it up to the point where it no longer pulls away easily. Be sure to support the tender growth underneath when you do this, so as not to cause damage or uproot the weak transplant.

Is it economical to go through and spend the labor freeing ugly onion transplants? I don't have a good answer. I think this year, when the weather prevented so many other field operations, there may have been/is an opportunity to use onion freeing as a way to keep crews occupied. Freeing the onions will do three things that could help improve yield:

1) Opens up more leaf tissue to actively photosynthesize and act as a source rather than a sink, which could help the plant grow more leaves relative to "trapped" onions. Having more photosynthate available should also help the plants withstand stress.

2) Exposes the leaves and the pores through which they grow, which could improve fungicide or insecticide treatments by increasing the surface area available for intercepting and absorbing sprays.

3) I think freeing onions will improve your thrips management. Thrips love to hang out in protected areas and when the onions are young, they'll feed way down in the sheltered base of the leaf. By themselves, thrips can strip out enough chlorophyll from the leaf to limit yield. To add insult to injury, thrips have been shown to vector onion rot from plant to plant. To stand any chance of controlling thrips early, you need to be able to see them. It is hard to see (and treat) thrips buried in leaves stuck within a restrictive collar.

Are these benefits worth time to free your ugly little transplants? You'll have to balance out how far behind your crop has fallen, the labor demands on your farm, the value of the crop (as jumbo/large vs medium sized bulbs), and how much trouble and investment you have with managing thrips.

Highlights from 2018 Post-Emergent Herbicide Trials in Muck-Grown Direct Seeded Onions: Buctril + Goal was the Winner

Christy Hoepting, CCE Cornell Vegetable Program

Figure 1. 2018 Post-emergent onion herbicide trial for control of mixed broadleaf weeds had heavy weed escapes with some species 4-6 inches tall/wide by the time onions were at 2-leaf. June 3, 2018.
Photo: C. Hoepting, CCE CVP

Hot spray/growing conditions, BIG Weeds

Weather conditions in late May and early June of 2018 were a bit on the hot and dry side with the weeds a bit tougher to kill and the onions a bit more tolerant to herbicide injury. To set the stage for a diverse spectrum of weed species, only Buctril 2E* 8 fl oz + Outlook 10 fl oz was applied PRE-emergent to onions and weeds. With such low rates, many weeds had reached 2-4 inches wide/tall by 1-leaf onion stage and 4-6 inches wide/tall by 2-leaf onion stage (Fig. 1), especially Lamb's quarter's, which were pretty much uncontrolled. The six main weed species that were evaluated in this trial include **Lamb's quarters (LQ), pigweed (PW), ragweed (RW), wormseed mustard (WSM), nightshade (NS) and wild buckwheat (BW)** (Fig. 2). Treatments were made with a CO_2 backpack sprayer, 25-32 psi, Teejet 8005 flat fan nozzles and 40 gpa. The trial was conducted in Elba muck on yellow direct seeded onion, c.v. Traverse. **Despite being a challenging situation to achieve great weed control, some treatments exceeded 90% control.**
Note: Brox 2E (a.i. bromoxynil) was used as "Buctril 2E".

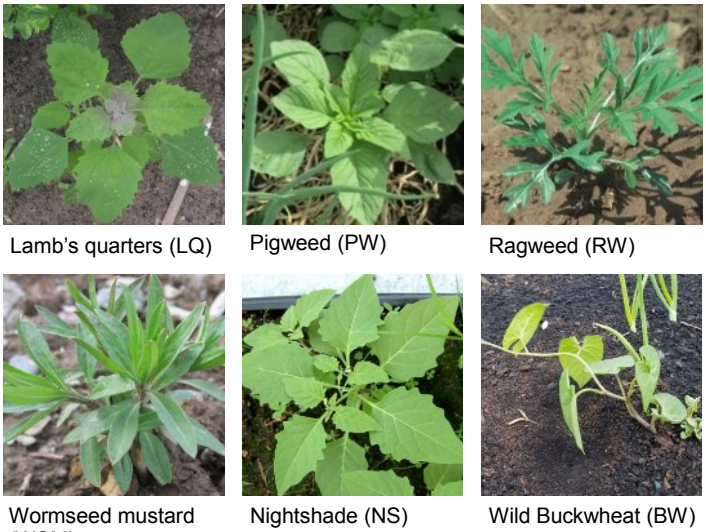


Figure 2. Main weed species present in 2018 POST-emergent herbicide onion trials.

Goal 2XL, Goaltender and Chateau not enough

- All of the following ***failed to control LQ 2-4", provided Excellent control of PW, and were safe on onions:***
  - Chateau 2 oz (1-leaf) fb. Chateau 1 oz (2-leaf) – ***PW 1-3" dead*** (Fig. 3b)
  - Goal 2XL 2 fl oz (1-leaf) fb. Goal 2XL 4 fl oz (2-leaf) - ***PW 1-4" dead*** (Fig. 3c)
  - Goaltender 1 fl oz/2 fl oz (1-leaf) fb. Goaltender 2 fl oz (2-leaf) – ***PW 1-2" dead*** (Fig. 3d)
- Chateau 2 oz (1-leaf) fb. Chateau 1 oz (2-leaf) resulted in Excellent control of small WSM (1-2" dead), and Very Good-Excellent control of NS (1-2" dead) and BW (2-3" dead). Overall, control of RW was Very Poor, but it did effectively kill RW 1".
- Goal 2XL 2 fl oz (1-leaf) fb. Goal 4 fl oz (2-leaf) had only Poor or Fair control of RW, NS and BW.
- **Goal 2XL was better than Goaltender** for LQ, PW, RW, NS and BW. Neither had activity on WSM (too big).
- **Early applications (1-leaf) of the low rates of Goal 2XL 2 fl oz and Goaltender 1 fl oz were no better than waiting until 2-leaf to apply high rates** (Goal 2XL 4 fl oz, Goaltender 2 fl oz).
- **Chateau 2 fl oz + Goaltender 1 fl oz (1-leaf)** fb. Chateau 1 oz + Goaltender 2 fl oz (2-leaf) **improved control of LQ, RW and NS over either alone** (Fig. 3e)**.** Best control of NS (Excellent: 1-4" dead) in trial. Tank mix and Chateau alone resulted in 10% injury, Goaltender 6%.

Buctril very safe, not enough control

- Buctril 2E 8 fl oz (2-leaf) was the safest treatment in the entire trial (1% visual injury 9 DAT).
- Failed to control LQ > 1", Poor control of PW, Fair control of NS, Very Good control of BW (1-3" dead) and some control of WSM (1-2" dead, 3" too big) (Fig. 3f).

Buctril 2E 8 fl oz + Goal 2XL 4 fl oz (2-leaf, 3-leaf) best in trial

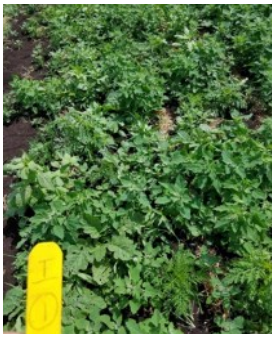
- By Jun 29, this treatment resulted in **94% reduction in weed biomass** (only 194 g/ 9 ft^2 compared to 3031 g/9 ft^2 in the untreated control)
- Excellent control of RW (2-3" dead) and BW (1-4" dead), Excellent-Very Good control of LQ (1-3" dead), RW (1-3" dead) and NS (4" dead), and Good control of WSM (2-3" dead) (Fig. 3g).
- Highest injury in trial – 16.7% visual injury 9 DAT 2-leaf on Jun 12, but not significantly different than best treatment for number of leaves per plant and plant height on Jul 25.
- **Lower rate of Buctril 2E 4 fl oz + Goal 2XL** resulted in **less LQ** (Very Good-Good, no mortality) **and WSM** (Fair, no mortality) control than high rate Buctril 2E 8 fl oz with **similar injury** (12%), because Goal 2XL caused injury.

continued on next page

- **Substituting Goaltender 2 fl oz instead of Goal 2XL 4 fl oz with Buctril 2E 8 fl oz** resulted in less LQ (Good/Fair-Poor, 1-2" dead in some plots) and NS (Failed) control, but had less injury (9%) (Fig. 3h). On Jun 29, this treatment resulted in 84% reduction in weed biomass.

Chateau + Nortron a Heavy Hitter

- Nortron is labeled in other states on mineral soil in onion, but not in New York.
- In this trial, compared to Buctril 2E 8 fl oz + Goal 2XL 4 fl oz, Chateau 2 oz + Nortron 16 fl oz (2-leaf) resulted in:
  - Very similar control of LQ (Good-Excellent: 1-4" dead) (Fig. 3i)
  - Better control of PW (Excellent: 2-4" dead), WSM (Excellent-Very Good: 1-3" dead), NS (Excellent-Very Good: 1-4" dead) and BW (Excellent: 6" dead).
  - Less control of RW (Fair: no mortality)
  - Less onion injury – 10% visual injury 9 DAT 2-leaf on Jun 12
  - 85% reduction in weed biomass on Jun 29



a) Untreated control

Figure 3. 2018 POST-emergent onion herbicide mixed broadleaf weed trial results: 9 days after 2-leaf treatment on Jun 12 when onions were at 4-leaf. Lamb's quarters was the dominant weeds species that escaped pre-emergent herbicide program and was 2-4" at 1-leaf and 4-6" at 2-leaf. *Photos: C. Hoepting, CCE CVP*

b) Chateau 2 oz (1-leaf) fb. Chateau 1 oz (2-leaf)

c) Goal 2XL 2 fl oz (1-leaf) fb. Goal 2XL 4 fl oz (2-leaf)

d) Goaltender 1 fl oz (1-leaf) fb. Goaltender 2 fl oz (2-leaf)

e) Chateau 2 oz + Goaltender 1 fl oz (1-leaf) fb. Chateau 1 oz + Goaltender 2 fl oz (2-leaf).

f) Buctril 2E 8 fl oz (2-leaf)

g) Buctril 2E 8 fl oz + Goal 2XL 4 fl oz (2-leaf)

h) Buctril 2E 8 fl oz + Goaltender 2 fl oz (2-leaf)

i) Chateau 2 oz + Nortron 16 fl oz (2-leaf)

j) Buctril 2E 8 fl oz + bicyclopyrone 3.42 fl oz (2-leaf)

k) bicyclopyrone 3.42 fl oz (1-leaf)

Buctril + bicyclopyrone will be the new power couple!

- Bicyclopyrone is a new active ingredient being developed by Syngenta for registration on onion, which is projected for New York in 2022.
- Like, Buctril 2E 8 fl oz + Goal 2XL 4 fl oz (2-leaf, 3-leaf), bicylopyrone 3.42 fl oz + Buctril 2E 8 fl oz (2-leaf) also resulted in **94% reduction in total weed biomass** on Jun 29, but **with only one application**!
- Unlike Buctril 2E 8 fl oz + Goal 2XL 4 fl oz (2-leaf, 3-leaf) bicyclopyrone 3.42 fl oz + Buctril 2E 8 fl oz was **one of the safest treatments in the trial** with only 5% visual injury 9 DAT 2-leaf on Jun 12, and the tallest plants with the most leaves per plant on Jul 25.
- Excellent control of LQ (1-4" dead), pigweed (2-4" dead), RW (3-4" dead) and BW (1-6" dead), Very Good control of WSM (1=3" dead) and Good control of NS (no mortality) (Fig. 3j)
- Excellent control of LQ provided by bicyclopyrone + Buctril was "magical" given that both failed to control LQ when used alone (Fig. 3f & k).

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continued from page 7 – Highlights from 2018 Post-Emergent Herbicide Trials in Muck-Grown Direct Seeded Onions

Highlights from Ragweed POST-Emergent trial

- Trial conducted in Linwood muck in direct seeded yellow onions, c.v. Fortress. Ragweed naturally escaped PRE-emergent herbicide program. Spray and growing conditions were "normal".
- **Buctril 2E 4 fl oz, 8 fl oz alone and with Goal 2XL 4 fl oz/Goaltender 2 fl oz were <u>all safe</u> on 2-leaf onion** – visual injury less than 10% 6 DAT 2 leaf on Jun 15.
- **Buctril 2E + Goal 2XL 4 fl oz significantly increased RW control** from 47% to 74% and RW mortality from 12% to 34% over Buctril 2E 8 fl oz alone (Fig. 4b & c).
- **Early application of Goal 2XL 2 fl oz (1-leaf) fb. Buctril 2E 8 fl oz increased RW control** to 85% and RW mortality to 39%, and prevented progression to larger weed stages. This early application of Goal 2XL "held" the RW back in smaller stages, which then made it "easier" for Buctril to control the smaller RW at 2-leaf.
- In this trial, there were **no significant differences between Buctril 2E 8 fl oz + Goal 2XL 4 fl oz or Goaltender 2 fl oz (2-leaf, 3-leaf)** for control of RW. Both resulted in 83-86% control 18 DAT 3-leaf on Jul 5, and **Buctril + Goaltender had significantly less visual onion injury** 6 DAT 2-leaf on Jun 15 (8% vs. 3.3%) (Fig. 4d).
- **Stinger failed to control RW and did not cause any RW mortality** in this trial (Fig. 4f). Healthy and injured weeds of the same size were right beside each other in the same plot.
- **Chateau 2 oz (1-leaf) resulted in 100% mortality of RW 1",** which reduced RW density (Fig. 4g).
- In general, Chateau resulted in better kill of RW 1" with very minor injury to any larger sized weeds, while Goal 2XL resulted in less RW mortality, but caused more injury to larger weeds.
- In general, Buctril 2E 8 fl oz > Buctril 2E 4 fl oz > Reflex 4 fl oz > Goal 2XL 4 fl oz = Chateau 2 oz > Stinger 4 fl oz.
- **Best control of RW was achieved with Buctril 2E 8 fl oz + bicyclopyrone 3.42 fl oz (2-leaf),** which resulted in 97% control and 89% mortality (1-4" dead) 6 DAT 2-leaf on Jun 15 (Fig. 4g). This treatment was not significantly different than Buctril 2E 4 fl oz + bicyclopyrone 3.42 fl oz (2-leaf) and Buctril 2E 8 fl oz/4 fl oz + Bicyclopyrone 1.7 fl oz (2-leaf, 3-leaf).

a) Untreated

b) Buctril 2E 8 fl oz (2 -leaf, 3-leaf)

c) Buctril 2E 8 fl oz + Goal 2XL 4 fl oz (2-leaf, 3-leaf)

d) Buctril 2E 8 fl oz + Goaltender 2 fl oz (2-leaf, 3-leaf)

e) Stinger 8 fl oz (2-leaf) fb. Stinger 4 fl oz (3-leaf)

f) Chateau 2 oz (1-leaf) fb. Stinger 8 fl oz (2-leaf) fb. Stinger 4 fl oz (3-leaf). Note, how Chateau reduced density by milling RW 1".

g) Buctril 2E 4 fl oz + bicyclopyrone 3.42 fl oz (2-leaf)

Figure 4. 2018 POST-emergent onion herbicide ragweed trial results:18 days after 3-leaf treatment on July 5 when onions were at 5-6 leaf stage. *Photos: C. Hoepting, CCE CVP*

For More Information

Detailed presentations of both of these trials are available in slide format as pdf files that include background information, data/results tables, trial photos and results summaries. Contact Christy Hoepting (cah59@cornell.edu; 585-721-6953) for copies.

Late Blight Risk Update

John Gibbons, CCE Cornell Vegetable Program

Potato planting is progressing across the area although slowed by the wet conditions. Potato volunteers started emerging around May 15th triggering the time to start severity value accumulations using Blightcast. Currently late blight has only been detected in northern Florida; we will continue to watch the national occurrence map to track late blight movement. Currently the tally of late blight SVs for many locations can still be found at http://newa.cornell.edu/index.php?page=potato-diseases. The first fungicide application will usually be triggered by the late blight forecast and should occur as soon as possible after 18 Blitecast severity values have accumulated since first potato tissue emergence in your region. Based on weather forecasts since May 15, no stations have exceeded the threshold risk if late blight was detected in the region. After 18 severity values have accumulated, the Cornell Simcast model is used to time sprays. This is currently found on the NEWA website.

Late Blight Severity Values* 5/28/2019

Location	Total	Forecast 5/29-5/31	Location	Total	Forecast 5/29-5/31
Albion	3	2	Kendall	4	4
Arkport	2	5	Knowlesville	5	2
Baldwinsville	8	4	Lodi	NA	NA
Bergen	4	2	Lyndonville	5	5
Buffalo	11	3	Medina	5	2
Burt	5	5	Niagara Falls	12	3
Butler	8	2	Penn Yan	3	8
Ceres	3	6	Rochester	6	2
Fairville	1	2	Sodus	6	3
Farmington	5	3	Versailles	6	3
Fulton	7	2	Wellsville	9	8
Geneva	0	2	Williamson	4	2

* Severity value accumulations start 5/15/2019

The Potato/Tomato late blight Decision Support System (DSS) has migrated in 2019 to a fee service that will be managed by UKKO Agro. We hope to have more information on this soon. In the meantime, additional information can be obtained by contacting Ketan Kaushish at ketan@ukko.ag

New Fungicides Registered

Mike Helms, PMEP; edited by Elizabeth Buck, CCE Cornell Vegetable Program

The DEC has approved **three Miravis fungicides as restricted use products in NY**. All three are available to growers upstate. **Pydiflumetofen is the active ingredient** common to all three products listed below, and is a **group 7 fungicide**. Pydiflumetofen has not previously been available to growers in NY. Check the product label (available online through the DEC) for diseases controlled within each listed crop.

Miravis Prime (EPA Reg. No. 100-1603) – also contains the active ingredient fludioxonil (group 12). Signal word Caution. Registered for use against various diseases on cucurbit vegetables, fruiting vegetables, grape and small fruit vine climbing subgroup, specific leaf petioles (including celery), specific leafy greens (including endive, lettuce, and spinach), potato, and tuberous and corm vegetables. **Miravis Prime use in Nassau and Suffolk Counties is prohibited**.

Miravis Neo (EPA Reg. No. 100-1605) – also contains the active ingredients azoxystrobin (group 11) and propiconazole (group 3). Signal word Warning. Registered for use against several diseases on canola, corn (including sweet), quinoa, soybean, and specific dried shelled beans.

Miravis Top (EPA Reg. No. 100-1602) – also contains the active ingredient difenoconazole (group 3). Signal word Caution. Registered for use against various diseases on several agricultural crops including dried shelled peas and beans, soybeans, and tuberous and corm vegetables (except potatoes).

Onion Crop Insurance Plan Information Collection Listening Sessions for Growers, Insurance Co. Staff & Agents

Agralytica of Alexandria, Virginia is conducting a review of the onion insurance plan on behalf of the USDA's Risk Management Agency (RMA). As part of the review, Agralytica staff will hold listening sessions with **growers, insurance staff and other interested parties** in several states. For New York, the sessions will be Wednesday, June 5 in Goshen (Orange Co.) and Thursday, June 6 in Newark (Wayne Co.).

The aim is to get feedback on how the program is working and how it can be improved. **This is an opportunity for producers, insurance staff and agents alike to communicate concerns and possible improvements for consideration.**

The dates, venues, and timing of the listening sessions are as follows:

Wednesday, June 5 Time: 2:00 – 4:00 pm	**Nutrien Ag Solutions** 900 Pulaski Hwy, Goshen, NY 10924 Tel: 845-651-5303
Thursday, June 6 Time: 10:00 am – 12:00 pm	**CCE of Wayne County** 1581 NY-88, Newark, NY 14513 Tel: 315-331-8415

If anyone would like an individual meeting, Agralytica staff will be available at the above locations. To arrange a time, contact Andre Williamson by cell at 240-432-0308 or by email at awilliamson@agralytica.com. Alternatively, anyone who cannot attend can submit e-mailed comments. Please use "Onion policy" in the subject line.

Waterhemp Herbicide Resistance Tests: Preliminary Results

Bryan Brown, NYS Integrated Pest Management, with collaboration from Antonio DiTommaso, Kathleen Howard, Mike Hunter, Jeff Miller, Scott Morris, Jodi Putman, Peter Sikkema, Mike Stanyard

Last summer, several populations of waterhemp (*Amaranthus tuberculatus*) survived herbicide applications in western NY corn and soybeans.

Growers asked if these weeds are actually resistant to certain herbicides. If so, which ones? And are all populations of western NY waterhemp resistant to the same herbicides, or do they differ?

To answer these questions, we collected seed from these surviving weeds at three locations in NY, we grew them in a Cornell University greenhouse alongside a population of waterhemp that we know is susceptible to herbicides, and then we used a spray chamber to apply a range of herbicides and rates.

The herbicides we used were glyphosate (i.e. Roundup, WSSA Group 9), atrazine (i.e. Aatrex, WSSA Group 5), lactofen (i.e. Cobra, WSSA Group 14), and imazethapyr (i.e. Pursuit, WSSA Group 2). The WSSA groups represented here are the ones waterhemp has developed the most resistance to in other states. For each herbicide, we used five different rates. Each rate was applied to five waterhemp plants from each population. Following the methods of other studies, plants were sprayed when they were around 5" tall. BASF Agricultural Solutions and Valent USA LLC supplied some of the materials for this study.

We'll be doing a final analysis three weeks after spraying. But here's how the NY populations look after only one week. At the full labelled rates, glyphosate resulted in 50% control and lactofen resulted in 99% control. Atrazine and imazethapyr resulted in poor control, but waterhemp plants were larger than the maximum size stated on the label.

But it's the comparison of our three NY populations to the susceptible population that determines resistance. Final control ratings will be done in two weeks, but initial results indicate that two NY populations are potentially resistant to glyphosate, three are potentially resistant to atrazine, none are likely resistant to lactofen, and two are potentially resistant to imazethapyr. So herbicides in WSSA Groups 2, 9, and 5 shouldn't be solely relied on to control this weed.

Since there were some differences between NY populations, we've shared each farm's results with the participating growers so they can make the necessary changes to their management plan.

So if you don't have it already, keep an eye out for waterhemp this year. It looks similar to other NY pigweeds, except that it's completely hairless and it has separate male (pollen-producing) and female (seed-producing) flowering heads. Since it can travel in seed, feed, and equipment -– make sure they're clean. And think about trying out some new weed control options.

NY Sweet Corn Trap Network Report, 5/28/19

Marion Zuefle, NYS IPM Program; http://sweetcorn.nysipm.cornell.edu

This is the first post for the 2019 season. Twelve sites reporting this week. Only two sites caught ECB-E (Seneca Castle and Hurley) and one site caught ECB-Z (Hurley). No other moths were caught. There are five new sites this year, Attica, Basom, Carlton, Lyndonville and Portville. To view a map of where all the current sites are located, visit the About page of the Sweet Corn Pheromone Trap Network blog at http://sweetcorn.nysipm.cornell.edu/.

Plantings have been delayed at several sites due to the wet spring, however, degree day accumulations for most sites are around the time for spring flight of ECB-E according to the development model from the University of Wisconsin (see chart below).

WNY Pheromone Trap Catches, 5/28/19

Location	ECB-E	ECB-Z	CEW	FAW	WBC	DD to Date
Batavia (Genesee)	NA	NA	NA	NA	NA	343
Bellona (Yates)	NA	NA	NA	NA	NA	359
Eden (Erie)	NA	NA	NA	NA	NA	357
Farmington (Ontario)	0	0	0	0	0	367
Geneva (Ontario)	NA	NA	NA	NA	NA	342
Hamlin (Monroe)	NA	NA	NA	NA	NA	312
Kennedy (Chautauqua)	NA	NA	NA	NA	NA	374
Lyndonville (Orleans)	NA	NA	NA	NA	NA	296
Penn Yan (Yates)	0	0	0	0	NA	353
Portville (Cattaraugus)	NA	NA	NA	NA	NA	373
Ransomville (Niagara)	NA	NA	NA	NA	NA	297
Seneca Castle (Ontario)	7	0	0	0	NA	333
Williamson (Wayne)	NA	NA	NA	NA	NA	283

ECB - European Corn Borer
CEW - Corn Earworm
FAW - Fall Armyworm
WBC - Western Bean Cutworm
NA - not available
DD - Degree Day (mod. base 50F) accumulation

European corn borer (bivoltine) development estimated using a modified base 50F degree day calculation.

Development Stage	Accumulated Degree Days
First Generation	
First spring moths	374
First eggs	450
Peak spring moths	631
First generation treatment period	800-1000
Second Generation	
First summer moths	1400
First eggs	1450
First egg hatch	1550
Peak summer moths	1733
Second generation treatment period	1550-2100

from J.W. Apple, Department of Entomology, Univ. of Wisconsin-Madison

Weather Charts

John Gibbons, CCE Cornell Vegetable Program

Weekly Weather Summary: 5/21 - 5/27/19

Location**	Rainfall (inch)		Temp (°F)	
	Week	Month May	Max	Min
Albion	0.83	4.25	84	41
Arkport	1.06	3.42	81	37
Bergen	0.52	3.21	84	38
Brocton	0.12	2.95	85	39
Buffalo*	0.41	3.29	82	42
Burt	0.82	3.97	82	57
Ceres	0.86	3.56	83	34
Elba	0.74	3.29	83	41
Fairville	0.46	4.21	79	40
Farmington	0.44	4.51	80	41
Fulton*	0.48	5.53	77	39
Geneva	0.69	3.75	78	43
Hanover	0.09	2.16	75	41
Lodi	0.55	3.15	79	41
Niagara Falls*	1.16	4.68	82	39
Penn Yan*	0.02	3.05	79	43
Rochester*	0.35	2.49	85	44
Sodus	0.49	4.57	78	39
South Bristol	0.59	3.02	78	42
Varick	1.84	5.77	79	43
Versailles	0.12	2.40	85	39
Williamson	0.21	2.91	79	41

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 - May 27, 2019

Location**	2019	2018	2017
Albion	201	341	268
Arkport	210	389	265
Bergen	216	319	257
Brocton	234	NA	NA
Buffalo*	194	380	280
Burt	157	264	230
Ceres	266	320	281
Elba	190	NA	257
Fairville	197	321	263
Farmington	201	231	268
Fulton*	197	320	285
Geneva	222	339	287
Hanover	234	337	NA
Lodi	243	366	340
Niagara Falls*	167	370	315
Penn Yan*	246	361	318
Rochester*	254	373	308
Sodus	195	310	274
South Bristol	219	353	285
Varick	252	359	330
Versailles	244	337	323
Williamson	178	283	256

* Airport stations
** Data from other station/airport sites is at: http://newa.cornell.edu/ Weather Data, Daily Summary and Degree Days.

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VEGEdge

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VegEdge is the award-winning 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 and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.

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Cornell Cooperative Extension
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