

maggot management recommendations.

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What herbicide will get the job done? Here's a table focused on common weeds in NY and those species for which the herbicide

yields good or excellent control.



If you want to maximize your onion yield every year, you need to understand adjuvants. Learn

what adjuvants are, the types of adjuvants, and how they work. PAGE 6

Volume 15



The 2019 New York vegetable pesticide updates include mostly new biologicals. Learn about new

registrations, label expansions, and more!

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May 1, 2019

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Cornell Cooperative Extension Cornell Vegetable Program

Maggot Pests

Robert Hadad, CCE Cornell Vegetable Program

INTRODUCTION

In late April, throughout May, and sometimes even into June, several types of maggots can attack crops. Adult flies emerge from overwintered pupae in the soil where a host crop was previously. They quickly mate and lay eggs at or near the base of some of our early crops. The flies are tiny and are easy to miss. The eggs hatch out maggots that move down into the soil and attack the young plant roots. These pests are onion maggot, cabbage maggot, and seed corn maggot.

SEED CORN MAGGOT

The seed corn maggot (SCM) can be present earlier than the other maggots. SCM have a wide host range. These include many early planted or seeded spring crops including allium, pea, brassicas, and of course, early seeded sweet corn. SCM prefer cool damp weather so besides spring,



Issue 06

Onion maggots. Photo: C. Hoepting, CCE CVP



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

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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.



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The next issue of VegEdge newsletter will be produced May 15, 2019.



Through an extensive 4-year project tracking economic, soil, and irrigation water data from NYS high tunnels, the CCE Cornell Vegetable Program has identified a number of BMPs growers can implement to stay on top of their high tunnel soil health.

Foliar test your crop & respond to the results

A foliar test, or tissue test, is a great way to monitor the nutritional status of your crop throughout the season by confirming/discovering nutrient deficiencies BEFORE symptoms appear. As a result, you can deliver only those nutrients your crop needs, thus saving yourself \$\$, saving your soils from excessive inputs, and producing better yields!

We recommend samples be taken two weeks post-transplant and then every 2-3 weeks throughout the growing season. Check with your local Extension educator to find a reputable lab in your area and then check with that lab for their specific sampling procedures.

continued from cover - Maggot Pests

they are also active in the fall. SCM can have 3-4 generations per season. The adults are flying just as the weed, Yellow Rocket sends up flower stalks and begins to flower. An image of Yellow Rocket is found just below.



Yellow Rocket. Photo: Maine Cooperative Extension

Seed Corn Maggot Management

- Avoid planting in fields where a host crop was present the previous season especially if the crop was harvested in the fall.
- Avoid planting or direct seeding into cold soils. Seeds planted shallower will quickly germinate becoming more established offering a little more resistance to attack.
- Avoid planting or direct seeding where plant residue has not had a chance for thorough degradation.
- Use treated seeds where available. Consult your seed company representative or check seed catalog descriptions for options.

CABBAGE MAGGOT

This pest feeds specifically on brassicas. The emergence of the cabbage maggot (CM) flies from soils where bras-

Hemp Happenings

Judson Reid, CCE Cornell Vegetable Program

Hemp, a multi-use crop that has been cultivated for centuries, is increasingly cultivated in New York. 'Industrial hemp' is a non-intoxicant version of *Cannabis sativa* with potential use as fiber, grain or processed consumer products. One of the uses of greatest interest is CBD. Cannabidiol (CBD) is receiving publicity as a supplement for relief of seizures, pain, and anxiety. It is made in trichomes of female flowers as a biochemical alternative to THC, the intoxicant found in marijuana.

In NYS permitees to grow hemp are regulated by Ag and Markets under close supervision. Previously NYSDAM set a firm deadline for farmers and processors to apply for CBD permits. Now the Department is accepting applications for:

- CBD growing: rolling basis, no deadline
- Grain and fiber growing: rolling basis, no deadline
- Grain and fiber processing: rolling basis, no deadline

The department is NOT accepting CBD Processing applications at this time.

sicas were grown before is close to the time of seed corn maggot flights but can be a little later. Flies are quite small and their maggots are tiny resembling a wiggling grain of rice. One indicator when flies should have emerged is when the weed, Yellow Rocket, has started to bud up and bloom.

Cabbage Maggot Management

- Previous season's brassica crop residue should be tilled under. The crop ground should be tilled again to help bury pupae.
- Don't plant or direct seed into brassica crop land. Rotate out of brassicas.
- Plant later into the spring rather than early spring to miss egg laying.
- When cultivating, set discs to through soil lightly stacked around crop stems.
- Use row cover over seedling or transplants.

ONION MAGGOT

As with cabbage maggot, the flight of the onion maggot flies coincides when Yellow Rocket blooms. Onion maggot flies begin their season when cabbage maggot flies are at peak. There are three generations per season. Besides root damage, onion maggots can crawl in between onion plant leaves and move down into the bulblet. Feeding damage weakens plants also allowing for disease to cause rot.

Onion Maggot Management

- Clean up onion or allium crop ground from previous season's crop. Remove residue or bury deeply.
- Destroy cull piles.
- On new allium ground, exclusion with new row cover or tight weave insect netting can help reduce infestation.
- Soil drench is an option if applied with high volume of water to soak down to the root zone. •

Please see the NYSDAM website for applications, sample research partner agreements, and an updated guidance document: <u>https://www.agriculture.ny.gov/Pl/</u> <u>PIHome.html</u> There is a non-refundable \$500 application fee for all new applications. If you do not have internet access please contact your local CCE office for assistance in printing an application.

The Department is also encouraging agricultural cooperatives to consider partnering in the purchasing, testing, processing, and distributing of farm supplies and farm business services related to industrial hemp. Agricultural cooperatives can share continued on page 4 resources and reduce financial risk in the emerging industrial hemp field while growing, processing, producing, and marketing industrial hemp and hemp products. Letters of interest from agricultural cooperatives wishing to participate in the industrial hemp research program must be submitted to the Department at

ag.dev@agriculture.ny.gov by June 6, 2019. Letters should provide information demonstrating the feasibility of growing, processing, and producing industrial hemp or hemp products under a farm-owned business structure.

Interested in learning more about growing hemp? Mark your calendar for these upcoming events. More details to come on <u>hemp.cals.cornell.edu/</u>

Summer 2019 Cornell Hemp Events:

- Eastern NY Hemp Conf & Expo Albany June 2-4
- Willsboro Farm Field Day July 10
- Aurora Farm Field Crops Field Day July 11
- Freeville Organic Farm Field Day July 31
- Long Island Hort Res Ext Center Plant Science Day July 31
- Hemp Workshop Empire Farm Days Aug 6-8
- Cornell Hemp Field Day Geneva Aug 13 O

What Herbicide Will Get the Job Done?

Elizabeth Buck, CCE Cornell Vegetable Program

With spring planting comes the use of soil-applied herbicides. The following are some of the more commonly used or broadly registered pre-plant incorporated (PPI) or pre-emergence (PRE) applied herbicides in vegetables. The aim of this table is to help you select the best herbicide to address your weed spectrum. Herbicide labels list many weed species as control targets. This table focuses in on common weeds in NY and those species for which the herbicide yields good or excellent control in research testing. Always check the product label for crop listings and use patterns.

Herbicide active ingredient	Mode of Action	Annual Grasses Controlled	Annual Broadleafs/Sedges Controlled	Species <u>not</u> controlled
Pendimethalin (ie Prowl)	3	Large crabgrass	Prostrate pigweed	Goosegrass
Trifluralin (ie Treflan)	3	Barnyardgrass	Pigweeds, common chickweed	Nightshades
S-metolachlor (ie Dual)	15	Green foxtail, volunteer oats	Yellow nutsedge, hairy galinsoga, redroot pigweed	Lambsquarters, common ragweed, mustards, velvetleaf
Dimethenamid (ie Outlook)	15	Annual grasses	Hairy galinsoga, hairy nighshade	Most annual broadleafs
EPTC (ie EPTAM)	8	Annual grasses		Annual broadleafs
Clomazone (ie Command)	13	Barnyardgrass, giant foxtail, goosegrass, large crabgrass	Velvetleaf, field bindweed (from seed), lambsquarters, hairy galinsoga, common ragweed, shepherd's-purse, ladysthumb	Hairy nightshade, pigweeds, common cocklebur
Halosulfuron (ie Sandea)	2	n/a	Yellow nutsedge, velvetleaf, common & giant ragweed, pigweeds	Lambsquarters, nightshades, annual grasses
Imazethapyr (ie Pursuit)	2	Foxtails	Nightshades, pigweeds, mustards	Common ragweed, lambsquarters, velvetleaf
Metribuzin	5	Foxtails, fall panicum	Lambsquarters, common ragweed, hairy galinsoga, pigweed, mustards, smartweed, purslane	Nightshade, barnyardgrass, crabgrass
Napropamide (ie Devrinol)	15	Fall panicum, barnyardgrass, crabgrass, foxtails	Pigweed, purslane	Common ragweed, nightshades, velvetleaf, mustards, smartweed •

Potato Tuber Black Heart

Yi Wang, University of Wisconsin-Madison, Vegetable Crop Update, April 28, 2019

In the past several weeks, we have received some questions about a dark black discoloration issue in or around the center of tubers.

This is a physiological condition referred to as black heart, caused by insufficient oxygen to support tuber respiration. Varieties can respond variably to low oxygen especially when stored for extended periods of time. Usually there is no cavity in black heart tissues. Affected tissue is firm, not soft or leaky, but when temperature rises to higher than 65°F, it can turn soft and



continued on next page

continued - Potato Tuber Black Heart

inky. Black heart can develop in field, at harvest, in storage, and during transportation inside trucks.

In the field, black heart is more commonly seen in waterlogged soils particularly in low areas. Saturated or nearly saturated soils can promote anaerobic conditions and reducing gas exchange within the tuber. Long exposure to high field temperatures (>90°F) before harvest can also lead to black heart. During storage, it can occur when proper ventilation is not supplied to the tubers. Warmer storage temperatures can increase tuber respiration rates and oxygen demands, which will facilitate black heart development especially when ventilation is not enough. Tubers used as seeds with black heart issues will have

Onion Crop Insights

Christy Hoepting, CCE Cornell Vegetable Program

Another cold April has made for a delayed and slow start to the growing season. Frequent rainfall events and cool temperatures (down to 26 °F on April 29) have not given cold soils much opportunity to warm up or dry up very quickly. Planting is behind schedule and just beginning in Wayne and Oswego counties. Direct seeded onions are taking their sweet time to emerge (I don't blame them).



Figure 1. Emergence is good in earliest planted direct seeded onions. April 30, 2019. *Photo: C. Hoepting, CCE CVP*

lower vigor and may not support emergence.

Therefore, management practices to avoid or reduce black heart include:

- Appropriate irrigation scheduling to minimize soil moisture accumulation, especially in the low areas of the field
- Maintenance of sufficient ventilation and proper temperature during storage
- Avoid deep pile and closed bins
- Minimize the amount of dirt and debris in storage that might prevent good airflow
- Proper distribution of air ducts in the storage facility
- Avoid poorly aerated trucks during transportation

The earliest planted fields have emerged with very good stand (Fig. 1). Earliest planted bare root transplants are nice and green and taking off. Hoping the weather will break so the crop can get into the ground and off to the races...

This year, for seed treatments, several growers are using Ever-Gol Prime instead of Pro Gro for onion smut and Trigard instead of FI500 for onion maggot. FI500 includes mefanoxam (= same active ingredient as Ridomil) for control of damping off. EverGol Prime does not have any activity on damping off. EBDC fungicides (FRAC M3) thiram and mancozeb also have some activity on damping off pathogens. Although mancozeb is not needed in -furrow with EverGol Prime seed treatment for onion smut, growers may still want to use it or Ridomil for damping off, especially under current cool damp planting conditions. Brian Nault is also recommending that Trigard be teamed up with Lorsban (or other chlorpyrifos product) in-furrow for best onion maggot control. Table 1 includes a guick summary of in-furrow treatment recommendations by seed treatment. Also, see article in April 3 issue of VegEdge for more detail and research results.

See article on adjuvant use in onions on page 6, which is a summary of Dr. Daniel Bergman's presentations that he gave at the Empire Expo in January.

Table 1. Recommended in-furrow treatments by seed treatment for direct seeded onion.

Sood Treatment	In-furrow Treatment		
	Must Include:	May want to Include:	
Pro Gro + FI500 (both have activity on damping off)	Mancozeb for onion smut	Lorsban for onion maggot (only in fields where pressure is high)	
Pro Gro + Trigard (Pro Gro has some activity on damping off)	 Mancozeb for onion smut Lorsban (chlorpyrifos) for onion maggot 	Ridomil for protection beyond Pro Gro + mancozeb (only when emergence is expected to be slow)	
EverGol Prime + FI500 (FI500 has activity on damping off)		 Lorsban for onion maggot (only in fields where pressure is high) 	
EverGol Prime + Trigard (nothing for damping off)	 Mancozeb or Ridomil for damping off Lorsban (chlorpyrifos) for onion maggot 		

What Every Onion Grower Should Know About Adjuvants

Daniel Bergman, Ph.D., Technical Representative, Nutrien Ag Solutions; with contributions by Joe Vaillancourt, Adjuvants Product Manager, Nutrien Ag Solutions

[Note: Dr. Daniel Bergman gave an excellent animated presentation on adjuvant use in onions at the Empire State Producers Expo in January. Since his talk was so very well-received by onion session participants, I asked him to write an article on the subject. Ed. C. Hoepting, CCE CVP]

If you want to maximize your onion yield every year, you need to understand adjuvants. Defined broadly, **an adjuvant is a product that enhances the ability of another product to work more effectively.** Adjuvants don't contain pesticidal active ingredients; instead, they aid active ingredients in overcoming environmental and equipment-based fail factors to maximize application performance.

Of course, in reality adjuvants are much more complex than that. There are many different types, and it's important to know which types to use in which situations. Using the wrong kind of adjuvant in certain conditions can actually cause more harm than good.

That's why the best advice on adjuvants that I can share with growers is this: *read the label*. If an adjuvant is recommended for use with a specific product, the label on that product will say so. It will also provide additional important information, such as adjustments to make if you're applying on a very hot day, have the wrong spray-tank pH or if you're dealing with high winds.

Unfortunately, reading the label can sometimes cause additional confusion, especially when you're mixing multiple products into a single tank. That's when a deeper understanding of adjuvants is extremely helpful.

With that in mind, let's talk about what the types of adjuvants are, how they work, and what you need to know.

Types of adjuvants

There are five main categories of adjuvants. They are:

- NIS (non-ionic surfactant): The most commonly used adjuvant, NISs are water-soluble and aid with coverage on the plant as well as with uptake. They're considered the workhorse of the industry because of their leafwetting ability and common use recommendations by many pesticide labels.
- 2) **COC (crop oil concentrate):** Mostly used with herbicides, COCs drive active ingredients into plants by helping with uptake and penetration.
- 3) MSO (methylated seed oil): Like COCs, MSOs are oils, but they act more aggressively than COCs. In other words, they accelerate the plant's uptake of active ingredients. They're also usually used with herbicides.
- 4) Organosilicones: These are silicon-based adjuvant systems that provide *extreme* wetting and aid in update and penetration. You have to be careful with 100% organosilicones products when applying to onions, because they can run the spray solution off the leaf of the plant and potentially running down into the neck of the onion, causing an excessive accumulation of spray solution. It's usually better to use silicon blends, which combine organosilicones with an oil or NIS.
- 5) **Spreader-stickers:** Most adjuvants in this category are more "stickers" than they are "spreaders," so the term is a bit of a misnomer. These are non-ionic adjuvants that impart adhesiveness to the pesticide solution, helping pesticides or fungicides to stay on leaves longer and resist being washed off by rain or irrigation.

How adjuvants work

Adjuvants work in a few different ways, all of which are designed to help other pesticidal products work more effectively. Adjuvants can:

- Modify droplet size. Put simply, adjuvants can make the droplets coming out of your sprayer larger, mid-ranged in size, or smaller. On a windy day, having larger droplets (500+ microns) means less drift, but larger droplets are more susceptible to bouncing or running off the leaf surface. Smaller droplets (< 150 microns), on the other hand, are more susceptible to drift. Most of the time, it's best to strive for a mid-range droplet (150-500 microns) for optimum drift management, leaf retention and coverage.
- Increase droplet retention. Droplets that run off the surface of a leaves aren't very effective at delivering pesticidal active ingredients to the plant surface. Adjuvants that retain spray droplets on the leaf surface are best.
- Improve leaf wetting. Because onion leaves are upright and have very waxy leaf surfaces, spray solution tends to poorly wet the leaf surface and do little good. Adjuvants help lower droplets' surface tension so the pesticidal products covers the leaf more efficient and gets through the waxy leaf cuticle and into the plant.
- Promote better uptake. Adjuvants can increase the rate of pesticide penetration through the plant cuticle and into the leaf surface.

As you can see, there's a lot to know about adjuvants. And while we can only touch on the basics in this article, having at least some level of knowledge comes in handy, because you can better understand what your product's label is telling you. If you're using a pesticide or plant protectant, it'll tell you to use adjuvants to improve penetration and performance. If you have tough weed conditions, labels may ask you can go with an oilbased adjuvant (a COC or MSO). If conditions exist that may cause a higher concern of phytotoxicity, an NIS recommendation may be the right answer. continued – What Every Onion Grower Should Know About Adjuvants



Pesticide AI's or dispersants are not effected in soft water. If the water source contains high amounts of calcium, magnesium or iron (hard water) reduction in the pesticide AI activity or mixability can occur. To fix this condition, a water conditioner can be added to reduce the above problems. *Image: Daniel Bergman, Nutrien Ag Solutions*

Adjuvants and tank mixes

It's entirely possible that a single tank mix will involve multiple pesticide products with each of their own adjuvant recommendation. While that isn't necessarily an issue it's on you to determine whether your particular mix will result in adjuvant conflicts. The first place to start is to go through your full list of label adjuvant instructions and sort them from most to least restrictive. If you give first consideration to your most restrictive instructions and go step by step, you'll be able to avoid most conflicts.

Which comes first? Chateau or Movento? Sometimes you have instructions on two products that are in direct conflict with each other. Here's an example involving an herbicide, Chateau[®] and an insecticide Movento[®] that you may want to use in very close proximity (we know the this combo should not be tankmixed). Chateau's label tells you not to use an adjuvant, because that will result in the onion taking up too much of it too quickly, resulting in excessive phyto. Movento, however, says it requires an adjuvant that aids in uptake to achieve maximum performance. Which do you spray first?

The solution: **Apply Chateau as directed, wait three to five days, then come back with Movento combined with an adjuvant** that improves penetration. It's worth repeating that with any of the above suggestions, be sure to follow the label instructions.

Check your conditions

You can have an encyclopedic knowledge of products and adjuvants and still run into issues. That's because pesticide products and adjuvants aren't always the only two variables at play. Heat, for example, is an important factor to consider. **If you're spraying on a hot day, you'll want to avoid high rates of oil-based adjuvants.** Oil-based products tend to have greater wax solubility at high temperature, which can too aggressively dissolve the waxy surface of the leaf. Obviously, that's bad. **Instead, go with an NIS.** It's water-based and more forgiving on a hot day. (This is one of the reasons NISs are considered an industry workhorse; they're the best option in a wide variety of situations.)

Another factor that **many onion growers may overlook is the quality of the water they use in their tank mix.** Many municipalities have hard water, which means it has high levels of calcium, magnesium or iron dissolved in it. These hard water metals bind with pesticide actives and built-in emulsifiers, thus reducing application efficacy. Hard water test strips can be used to quickly determine if you need to use a water conditioning agent.

Don't underestimate the importance of checking the hardness of your water. It's an issue that can directly impact your pesticide use efficiency and yield if it isn't addressed properly. While not as important or common as water hardness, the pH level of your water is also worth checking. As with hardness, this is easily checked using readily available test strips. **Ideally you want your spray-tank water to be neutral or slightly acidic.** If anything, your water supply is likely to have a higher pH than is ideal, but an acidifier will easily help with that needed adjustment.

A few cautions for onion growers

In addition to the general guidelines and information already discussed, it's worth taking a moment to address a few situations that are common to onion growers. One involves **EC (emulsifiable concentrate) pesticides**, which are often applied to onions. These formulations have solvents in them that **can be aggressive**, so you want to think harder about your adjuvant choice, to make sure you aren't overdoing it. And remember, if you're applying on a hot day, avoid using an oil-based adjuvant to reduce the risk of phytotoxicity.

Another factor to watch is **excessive** acidification. If you're using metalbased fungicides (such as those that include copper or tin), don't use an adjuvant that reduces pH and thus increases the acidity of your mix. If you acidify your tank mix too much, you can end up with too much copper or tin available. This in turn can cause plant phyto.

Three little words

I said it a few times already, but it's worth repeating: *read the label*. The vast majority of the time, the labels on the products used in your tank mix will tell you everything you need to know about which adjuvants to use and when to use them.

Hopefully you now have a little bit more understanding of adjuvants that you can apply this season and into the future. When in doubt, seek the assistance of your <u>Nutrien Ag Solutions</u> crop consultant. It's better to get good advice and information upfront than risk your yield. Best of luck out there this season! [Similar crop consultations are offered by other industry reps in our region. Ed. C. Hoepting, CCE CVP]

2019 Vegetable Pesticide Updates: Mostly New Biologicals

Christy Hoepting, CCE Cornell Vegetable Program

Changes in pesticide registrations occur constantly and human errors are possible. Read the label before applying any pesticide. No endorsement of companies is made or implied. Other pesticide updates that we missed are welcome. Information was <u>last updated on April 30, 2019</u>. Updates after this date will be posted in future issues of VegEdge.

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

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

New EPA Nos., same products, as DuPont insecticides transitioned to FMC

As a result of the merger between Dow AgroSciences and DuPont (the company is called Corteva), DuPont insecticides were divested to FMC Corporation. Avaunt, Coragen, Exirel and Verimark have all been re-registered with EPA and NYDEC by FMC Corporation and now have new labels with new EPA numbers (Fig. 1). The products are exactly the same. Make sure that the label and your spray records match the product that you are using. Both DuPont and FMC products will be in the supply chain.

Trade Name	DuPont EPA No.	FMC EPA No.
AVAUNT Insecticide	352-597	279-9587
CORAGEN Insecticide	352-729	279-9606
	Zee for cabbage maggot	
EXIREL Insecticide	352-859	279-9615
	2ee for carrot weevil*	
	2ee for striped cucumber beetle*	
	2ee for swede midge*	
VERIMARK Insecticide	352-860	279-9616
	2ee for striped cucumber beetle*	

*Pests listed on DuPont 2ee labels are now included in FMC primary label. If DuPont products are being used for these pests, both 2ee and primary labels must be in possession of the user at time of application.



Figure1. Exirel label by DuPont (left) and FMC Corporation (right). DuPont has divested their insecticides to FMC, who had to re-register the products. They are the same products but now have new labels and new EPA numbers. Make sure that your label/spray records match the product that you are using.

- AGRIPHAGE Antimicrobial: (EPA No. 67986-1-70051; a.i. contains 8 strains of phages (bacteria attacking viruses); Certis USA). For preventative and firstdetection use against Bacterial Spot of tomato and pepper, and bacterial speck of tomato. For greenhouse seedling and field use.
- AGRIPHAGE-CMM Antimicrobial: (EPA No. 67986-6-70051; a.i. contains phages (bacteria attacking viruses); Certis USA). For preventative and first-detection use against Bacterial Canker of tomato. For greenhouse seedling, hydroponic greenhouse, and field use.

- AMPLITUDE Biofungicide (EPA No. 84059-28; a.i. *Bacillus amyloliquefaciens* strain F727 cell culture & fermentation products; Marrone Bio Innovations). Broad spectrum label for suppression or control of soilborne and foliar plant diseases in onions (bulb and green), legumes (dry beans and green beans), potatoes and carrots. This is an OMRIlisted organic fungicide.
- AMPLITUDE ST Biofungicide (EPA No. 84059-28; a.i. *Bacillus amyloliquefaciens* strain F727 cell culture & fermentation products; Marrone Bio Innovations). A seed treatment for suppression or control of soilborn diseases in sweet corn, succulent and dry beans and potato. This is an OMRI-listed organic material.
- BOTEGHA Mycoinsecticide: (EPA No. 82074-1; a.i. Beauvaria bassiana strain GHA; LAM International Corporation). For control of grasshoppers/crickets, aphids, thrips, leafhoppers, caterpillars/worms, stem borers, beetles, plant bugs and weevils in all vegetables. This is an OMRI-listed organic insecticide option.
- ECOSWING Botanical Fungicide: (EPA Reg. No. 10163-357; a.i. Extract of Swinglea glutinosa (ESG); Gowan). This is the first product registered in New York State containing this active ingredient. For foliar control of leaf diseases such as powdery mildew, Alternaria and Botrytis diseases. In brassicas (cabbage, broccoli, etc.), bulb crops (onions, etc.), Cucurbits, fruiting vegetables (pepper, tomato, etc.), leafy vegetables, dry and succulent legumes (peas, beans), root vegetables (beets, carrots, etc.), potato and herbs. This is an OMRI-listed organic fungicide option.

- HOMEPLATE Herbicide: (EPA No. 67702-54-70051; a.i. capric acid and caprylic acid; Certis USA). Nonselective fast-acting herbicide for burndown of broadleaf weeds, grasses, algae and mosses. For use in brassicas, cucurbits, fruiting vegetables (pepper/tomatoes), legumes, (beans and peas), bulb crops (e.g. onions, etc.), potato, leafy vegetables, root vegetables (carrots, beets), asparagus, herbs and in greenhouse. This is an OMRI-listed organic herbicide option.
- STARGUS Biofungicide (EPA No. 84059-28; a.i. Bacillus amyloliquefaciens strain F727 cell culture & fermentation products; Marrone Bio Innovations). Broad spectrum label for suppression or control of plant diseases. Crops include asparagus, bulb vegetables, leafy brassicas, cucurbits, fruiting vegetables, herbs, leafy vegetables, legumes, root tuber and corm crops (potato). This is an OMRI-listed organic material.

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

 MINECTO PRO Insecticide: (EPA No. 100-1592; a.i. cyantraniliprole and abamectin; Syngenta). Label expanded to include use on dry and succulent beans for control of earworm, leafminors, potato leafhopper and spider mites. • **PORTAL Miticide/Insecticide**: (EPA No. 71711-19; a.i. Fenpyroximate; Ninchino America) – Added potato and tuberous & corm vegetables (including sweet potato, ginger, and Jerusalem artichoke) for the control of labelled mite species, potato leafhopper, and potato psyllid.

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

• None

Special Local Needs (SLN)

 RETURN Insecticide/Nematicide: (EPA No. NY-180003; primary label EPA No. 83100-53-83979; a.i. oxamyl; Rotam North America). Generic Vydate for control of stem and bulb nematodes as a broadcast incorporated or in-furrow application in bulb onion. For control of onion thrips as a foliar application in bulb onion. Federally-Restricted Use – Danger-Poison.

Products Being Phased Out

- **BELT Insecticide:** (EPA No. 264-1025; a.i. flubendiamide; Bayer). Bayer stopped shipping and selling Belt as of 7/29/16. It can be sold and applied through 12/31/19, and it is canceled for 2020.
- FORCE 3G Insecticide: (EPA No. 100-1075; a.i trifluthrin; Syngenta). Will no longer be produced. It will be **replaced by FORCE 6.5G** (EPA. No. 100-1625). This is a granular planter box treatment for control of soil insects in corn (including sweet corn). Planters will need to be re-calibrated because 6.5G is a smaller granule and used at lower rates.

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 Labeled in New York

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

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.



Potato Early Season Disease Considerations

Amanda Gevens, University of Wisconsin-Madison, Vegetable Crop Update, April 28, 2019; edited by J. Kikkert, CCE Cornell Vegetable Program

Wet and cool soils delay germination and emergence. Such conditions also promote activity of plant pathogens, such as Rhizoctonia solani, a potentially seed-, soil-, or debris-borne fungal pathogen which causes stem or stolon cankers resulting in reduced stands, stunted plants, and/or reduction in tuber number, size, or quality. Later in the season. Rhizoctonia can also cause black scurf on tubers. Cultural management approaches such as planting when soil temperatures are more consistently above 46°F, planting into welldrained soils, avoiding planting too deep, and avoiding hilling prior to adequate emergence can limit early season stem and stolon canker.

Several other seed-, soil-, and/or debris -borne diseases can also impact the potato crop, including **Fusarium seed piece decay** caused by the fungus *Fusarium sambucinum*, **Silver scurf** caused by the fungus *Helminthosporium solani*, and **Late blight** caused by the oomycete *Phytophthora infestans*. While optimum temperatures for promoting each of these diseases vary, all require high soil moisture levels.

Fusarium, is a dry rotting pathogen which requires wounds for entry, can affect quality of seed potatoes in storage and lead to further disease concerns when potatoes are moved and warmed for planting. As a seed piece decay pathogen, Fusarium can affect seed immediately after cutting and through to sprouting. If initial and subsequent sprouts continue to be affected by Fusarium, the seed piece loses vigor and stand is reduced.

The **Silver scurf** pathogen is favored by warmer conditions and is recognized as a weak soil-borne and a stronger seedborne pathogen. Typically, symptoms are not evident on tubers at harvest, but develop over time in storage. The longer the tubers remain in the ground after vine kill, the greater the risk for development silver scurf. Blemishes on tubers are restricted to the periderm. However, damage to the periderm causes increased water loss and shrink. The pathogen is not known to cause above ground plant symptoms.

Fungicide seed treatments have a place in an integrated pest management (IPM) plan which includes cultural practices such as i) planting certified potato, ii) proper handling and sanitation of storage/cutting/curing facilities prior to planting, iii) cultivar resistance, iv) biological control, and v) chemical control. In combination, IPM practices minimize economic losses to disease, minimize environmental effects, limit risk of pesticide residues in the food supply, limit development of fungicide-resistant pathogen strains, and limit development of pathogen strains which may overcome host disease resistance.

Seed cutting and planting events provide opportunities for application of fungicides to reduce negative effects of diseases such as Rhizoctonia, Fusarium, silver scurf, and late blight. While this article specifically addresses seed treatments in potato disease control, several potato fungicides are registered for in-furrow application and are also effective in managing seed- and soil-borne diseases. While seed-applied fungicides can enhance disease control and crop success, be mindful that some of the fungicides are contact only (ie: mancozeb and fludioxonil) and are active by limiting direct infection to the protected seed piece. Systemic fungicides (ie: flutolanil and cymoxanil) are xylem mobilized, moving the fungicide upward and outward (acropetally) for protection beyond the point of contact. Generally, seed-applied fungicides provide, at most, 10-14 days of disease protection. However, some active ingredients can protect seedlings considerably longer when applied at the highest labeled rate.

Typically, seed treatments are applied right after cutting with either a liquid or powder formulation. Taking care to avoid clumping or thick coating of the treatment is important as you can cut off oxygen to the seed piece and limit suberization (and promote soft rot). Good suberization of cut seed pieces is a critical component of potato disease management and should include a 3-4 day, 50-55°F, 90-95% relative humidity period with cut seed piled no deeper than approximately 6 ft to maximize airflow throughout the pile.

Seed treatments in potato have received increased interest and use in recent years due to improvements in active ingredients available, and the return on the investment of early season disease control. As there are no true rescue treatments for underground diseases post-planting, seed treatments provide a most effective use pattern with added benefits of relative ease of application, small volumes of fungicide necessary, no spray drift, and no waste or negative impact on non-target sites.

Several fungicides with effective control of multiple diseases are available with registration for application to seed pieces prior to planting. Always read and follow the pesticide label prior to use.

In special consideration of late blight control in potato, key components of management include:

1) Destroy all potato cull piles

- 2) Manage potato volunteers in all fields -volunteers pose great risk for late blight introduction
- Acquire disease free seed from a reputable certified source –infected seed poses great risk for introduction
- If there is a risk of disease associated with seed, use seed treatment or infurrow application of effective late blight controlling fungicides (seed treatment is best)
- 5) Scout regularly and thoroughly for disease in all potato fields
- If late blight is identified in a field, have a mitigation plan in place for specific site. Depending on days to

continued - Potato Early Season Disease Considerations

vine kill, environmental conditions, and extent of infection – plan may vary from complete crop destruction to early vine kill with continued maintenance fungicide sprays. Mitigation plan should limit disease spread within field and from field-to-field.

Note from J. Kikkert: New York growers should refer to the information found on pages 301-304 in the 2019 Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production. To track where late blight has been reported and which isolates have been found, go to <u>www.usablight.org</u>. If you find late blight on your farm it is important to have a sample sent to Cornell for genotyping. This is important since the identity of the particular genotype of the late blight pathogen present in the field during the current season can help to determine which fungicide treatments should be considered for control. See the information on page 301 of the Cornell Guidelines or contact one of our staff members to collect a sample. •

Upcoming Events

view all Cornell Vegetable Program upcoming events at CVP.CCE.CORNELL.EDU

Women in Ag Discussion Group (W.A.V.E.S.)

Monday, May 6 | 6:30 – 8 pm

Groundworks Market Garden

1698 Genesee St, Buffalo, NY 14211

Hosts: Mayda Pozantides (Groundworks Market Garden) & Allison DeHonney (Urban Fruits & Veggies)

Commodity: Urban Farming

Business Topics: Positive Public Relations and Navigating Municipal Ordinances

Production Skill: High Tunnels, Urban Soils, and Adapting Farming Techniques

View the full Women in Ag discussion group schedule on the Cornell Vegetable Program website at <u>https://</u> <u>rvpadmin.cce.cornell.edu/pdf/event/pdf1177_pdf.pdf</u>

To register for the group, call Cornell Cooperative Extension of Erie County at 716-652-5400.



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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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