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Eastern NY Commercial Horticulture Program

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Vegetable News

Post Emergent Sweet Corn Herbicides

Chuck Bornt, ENYCHP

The last couple weeks have been great for getting crops in the ground including sweet corn. However, as with most things that are too good to be true, the dry weather may cause some issues with our pre-emergent herbicide programs. Remember that most of the pre-emergent herbicides we use are seed germination inhibitors and require moisture to work, something that we haven't had that much of in the last couple of weeks. And, usually moisture is required within a week of application, otherwise the herbicide activity may be reduced.

The good news is we have some post-emergent materials to choose from (see Table 1). There are a couple of other things you will need to know before making your selection. First, you need to know what weeds you are going after. Second, you will need to know the stage of your sweet corn in order to know if you can broadcast the materials or use drop tubes to keep the herbicides out of the whorl in order to reduce the chance of injury to the crop. And, you need to really pay attention to the labels of these materials. In order for these herbicides to perform their best and have the best crop safety, you need to know which are the right adjuvants required and other additives such as a nitrogen source. Those could be either a UAN (urea ammonium nitrate or more commonly called 32% liquid nitrogen) or a sprayable grade AMS (ammonium sulfate). If you are going to be tank mixing more than one herbicide, I **highly recommend** that you read the labels and make sure that the chemicals and almost as important, the additives are compatible. This is not only for crop safety, but efficacy of the materials used too! For example, Accent Q requires a Non Ionic Surfactant (NIS) or Crop Oil Concentrate (COC). If you want to use it with Impact/Armezon, you would have to choose the COC instead of the Methylated seed oil (MSO) or non-ionic (NIS) in order to be sure the combination would be safe and effective. See Table 2 to help determine which additives are recommended for the different herbicides, but this is no substitute for reading the product labels!

Notes about Atrazine: Many of the products mentioned will benefit from the addition of 0.25—0.5 pounds of active ingredient of atrazine. As atrazine has been one of the key materials used in our pre-emergent programs, it has been recommended that vegetable growers not use more than 1.5 lbs of active ingredient of atrazine per acre per season. This is so that other vegetables can be planted the following season without worrying about atrazine carryover and injury issues on those crops. Lumax/Lexar has become a popular pre-mix pre-emergent herbicide (atrazine, Dual and Callisto) for sweet corn growers at a rate of 2.5 quarts per acre. At this rate there is 0.78 lbs. of actual atrazine (active ingredient) in that Lumax which means you can still use some atrazine in your post-emergent applications. If you used the newest pre-emergent herbicide called Acuron (atrazine, Dual, Callisto and bicyclopyrone) at 2.5 – 3.0 quarts to the acre, then it has 0.63 – 0.75 lbs of actual atrazine when used at those rates. So again, you have some flexibility with adding some additional atrazine with a post emergent application.

Determining your rate of atrazine: For example, if you have in your shed AAtrex 4L (4 pounds atrazine per gallon) and you want to add 0.25 pounds as part of your post emergent mix, you would add 1/2 pint of AAtrex 4L. Also, the label states that atrazine should not be used on corn taller than 12" in height. For other calculations with other formulations contact Chuck Bornt at 518-859-6213.

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Sweet Corn Trap Catches

Date	County	ECB-E	ECB-Z	CEW	FAW	WBC
31-May	N. Washington	5	0	NA	NA	NA
31-May	S. Washington	2	0	NA	NA	NA
31-May	Albany	1	1	NA	NA	NA
31-May	Fulton	2	0	NA	NA	NA
31-May	Orange	0	2	NA	1	NA

Table 1: Post emergent sweet corn herbicides (please note this is not a complete table of all products labeled for post emergent sweet corn but those that have been showed to be most effective.)

Product (active ingredient)	Pre-harvest interval	Weeds controlled	Rate	Comments
Impact or **Armezon** topramezone	45 days	barn-yard grass, fall panicum, fox-tails,crabgrass lambsquarter, ragweed and vel-vetleaf	0.75 fluid ounces	Best control will also occur if broadleaf weeds are less than 4" tall and grass weeds are less than 3" tall. It is also recommended that 0.25—0.5 lbs active ingredient of atrazine be added to improve weed control and residual. Weeds need to be actively growing. Coverage is essential and if you are using this on taller corn, I recommend drop nozzle's be used in order to get the spray material down through the canopy and onto the weeds. If you used Lumax, Lexar or Acu-ron pre-emergent, or any other combination containing Callisto, you will need to add either atrazine or one of the other labeled materials found on the Impact/Armezon labels for resistance management. Addition of atrazine products will enhance control and provide resid-ual control as well. **Adjuvants:** Methylated seed oil (MSO) or petroleum-based or vegetable seed-based oil concentrate (COC, HSOC) at 0.5 to 1.0 gallon per 100 gallons of water [0.5% to 1.0% volume/volume (v/v)]. **Nitrogen Fertilizer:** nitrogen-based fertilizers include urea ammo-nium nitrate(UAN; 28% or 34%) at 1.25 to 2.5 gallons per 100 gal-lons of water (1.25% to 2.5% v/v) or a spray grade ammonium sul-fate (AMS) at a minimum rate of 8.5 to 17 pounds per 100 gallons of water.
Armezon Pro (topramezone + dimethena-mid-p)	**50 days**	Broadleaves and several annual grasses (barnyard grass, crabgrass, Giant Foxtail, Wild Proso Mil-let)	For sweet corn and popcorn label rec-ommends 20 fluid ounces per acre	Best control will also occur if broadleaf weeds are less than 4" tall and grass weeds are less than 3" tall and actively growing. **Applica-tions can be made from corn emergence to 12-inches tall. DO NOT apply within 50 days of harvesting sweet corn ears. Adjuvants:** Armezon PRO Alone: Methylated seed oil (MSO) or petroleum-based or vegetable seed-based oil concentrate (COC, HSOC) at 0.5 to 1.0 gallon per 100 gallons of water [0.5% to 1.0% volume/volume (v/v)]. Tank Mixtures with Armezon Pro: Use nonionic surfactant (NIS) at 0.25 to 0.5 gallon per 100 gallons of water [0.25% to 0.5% volume/volume (v/v). Oil-type adjuvants (COC, HSOC, and MSO) may be used in tank mixtures with Armezon PRO, however, combinations with these adjuvants can cause elevated necrosis within a few days after treatment and occasionally crop height reduction. Oil-type ad-juvants are not recommended when tank mixing with atrazine. **Nitrogen Fertilizer:** nitrogen-based fertilizers include urea ammo-nium nitrate(UAN; 28% or 34%) at 1.25 to 2.5 gallons per 100 gal-lons of water (1.25% to 2.5% v/v) or a spray grade ammonium sul-fate (AMS) at a minimum rate of 8.5 to 17 pounds per 100 gallons of water.
Accent Q (nicosulfuron plus a safener)		Mostly annual grasses	0.9 ounces per acre	Accent Q will provide post emergent control of most annual grasses (limited crabgrass control) and if applied alone has very little broad-leaf control (Redroot pigweed). If additional broadleaf control is also needed, consider tank mixing Accent Q with another herbicide listed in the label. Applications of ACCENT® Q may be applied broadcast or with drop nozzles (post-directed) on sweet corn up to 12 inches tall or up to and including 5 leaf-collars (V5) . For sweet corn 12 - 18 inches tall, apply only with drop nozzles. Do not apply to sweet corn taller than 18 inches or those which exhibit 6 or more leaf-collars (V6), and make only one application of ACCENT® Q per year. DO NOT APPLY ACCENT® Q to corn previously treated with "Counter" 15G or to corn treated with "Counter" 20CR in-furrow or over the row at cultivation. *continued on next page*

Accent Q				*(Continued from Page 2)* Applications of ACCENT® Q to corn previously treated with "Counter" 20 CR, "Lorsban", or "Thimet" may cause unacceptable crop injury, especially on soils of less than 4% organic matter. **Adjuvants:** Crop oil concentrate (COC) or Non-Ionic Surfactant (NIS) plus a sprayable grade ammonium nitrogen such as UAN or AMS. See label for specific rates and uses.
Supplemental labeling for **Accent Q tank mixed with Impact and atrazine** – If using this combination, the user must have in their possession a copy of this supplemental label! Accent Q may be applied with 0.5 – 0.75 fluid ounces per acre of Impact plus 0.375 – 1.5 pounds per acre active ingredient atrazine (12 – 48 fluid ounces of a 4L formulated atrazine product). However, if you have used any atrazine containing pre-emergent products, the general rule of thumb for rotating vegetables the following year after using atrazine is no more than 1.5 pounds total active ingredient per acre. More than that and you greatly increase the potential for atrazine injury to susceptible crops.				
Permit (halosulfuron)		Broadleaves (pigweed, velvetleaf, ragweed) and Yellow nutsedge	0.67 ounces per acre	Apply PERMIT over the top or with drop nozzles from the spike through layby stage of the corn. Treat young actively growing broadleaf weeds 1 to 3 inches in height. **Adjuvants:** Nonionic Surfactant (NIS) is required in the spray solution. Use NIS at 0.25 to 0.5% v/v concentration (1 to 2 quarts per 100 gallons of spray solution). Do not use COC or MSO as the potential for injury is too great. **Nitrogen fertilizers:** May be added but are not necessary for postemergent applications. Apply a high quality, granular spray grade ammonium sulfate at a rate of 2 to 4lb/A or a liquid nitrogen fertilizer solution (e.g. UAN 28%) at a rate of 2 to 4 quarts/A. Use of soil or foliar applied systemic organophosphate insecticides on PERMIT treated crops may increase the potential for crop injury and/or the severity of the crop injury.
Stinger (clopyralid)	30 days	Broadleaves (ragweed, wild buckwheat, Common cocklebur, Jerusalem artichoke, Canada thistle)	0.33 – 0.66 pints per acre	Apply Stinger any time after sweet corn emergence through 18-inch tall sweet corn uniformly with ground equipment as a broadcast or directed spray in 10 to 20 gallons total spray volume per acre. Do not exceed 2/3 or 0.67 fluid ounces per year. Do not apply to sweet corn that is greater than 18" tall. Control of common cocklebur, common ragweed, giant ragweed, sunflower, other annual weeds and Jerusalem artichoke, apply 1/4 to 1/2 pint of Stinger per acre from weed emergence up to the 5-leaf stage of growth. I would recommend using Stinger alone and not in tank mixtures at this time.

Table 2: Comparison of adjuvants and other additives used in post-emergent sweet corn herbicides. This is not a substitute for reading the herbicide labels.

Herbicide	Crop Oil Concentrate (COC)	Non Ionic Surfactant (NIS)	Methylated seed oil (MSO)	Nitrogen (UAN or AMS)
Impact/Armezon	**X**		**X**	**X**
Armezon Pro (used alone)	**X**		**X**	**X**
Armezon Pro (in tank mixes)		**X**		**X**
Accent Q	**X**	**X**		**X**
Permit		**X**		**X**
Stinger	**None required**			

Poor Germination? Check for Seed Corn Maggots

Amy Ivy, ENYCHP

Seed Corn Maggot adult fly. Photo: K. Campbell-Nelson

Seed corn maggot inside a kernel of corn. Photo: J. Obermeyer, Purdue Univ.

Nobody likes maggots, just the word is enough to turn you off. Maggots. Even an insect lover like myself is repelled by them. Maggots are the larval form of members of the Fly Order, Diptera. In North America there are 108 families within this order and 16,914 species including deer flies, black flies, mosquitos, craneflies, fruit flies and the loathed no-see-ums.

There is at least one beneficial Diptera, hover flies, also known as flower flies or syrphid flies, whose maggots feed on aphids, thrips and the eggs of spider mites. And there are probably many more beneficial, or at least benign, Dipterans.

But this article is going to focus on a maggot that can cause serious injury to vegetable crops this time of year: the seed corn maggot, *Delia platura.* If you've had poor or spotty germination in any number of large-seeded crops this year including corn, any of the beans, peas, squash and cucurbits and even some seedlings, take a look in the soil to see if you can find any maggots. They are pretty easy to spot: small, creamy white, worm-like creatures with no legs with a blunt end and a pointed end are their classic features. Another clue is that you will seldom find just one maggot, they more typically appear in large numbers, massed together which further adds to their yuk factor. If they are attacking seeds, you may find just one per seed, but several seeds in an area are usually infested.

In the May 26 issue of *U Mass Extension Vegetable Notes* they make the following observations about pupae and adults emerging under row cover this spring:

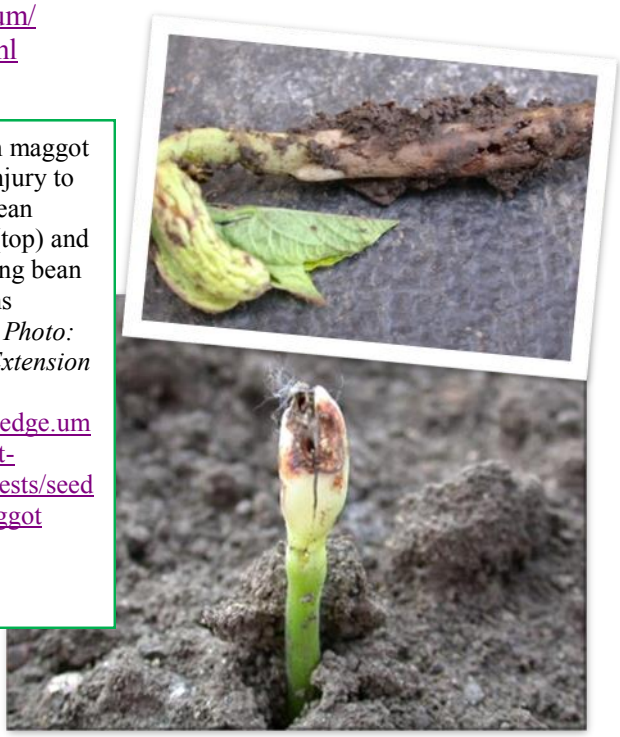
Seed corn maggot pupae have been found in large numbers in fields where cover crops were incorporated and after causing severe damage in cucurbit seedlings, adults are emerging by the hundreds under row cover. Both of these observations were made this week in Hampshire Co., MA. Reports of damage from this pest have been widespread this season coming from VT, NH, CT and MA. Fields fertilized with seed meals (ie. soybean, peanut) have also experienced problems with this pest which is attracted to these fertilizers for food. After adults emerged in the warm snap in April when peak flight occurred at 360 GDD base 40°F, they laid eggs which hatched and fed on transplants and seedlings for 2-3 weeks before pupating. The first generation of this pest is now complete. Finding adult flies under row cover now may be alarming, but is no longer a large concern. There may be 2-3 generations in New England, but the larvae of the first is the most damaging.

And from the sweet corn chapter in the Cornell Crop and Pest Mgt Guidelines:

Root maggot adults prefer soil with decomposing organic matter. Incorporate crop or cover crop residues well before planting and allow 2-3 weeks between incorporation and planting. Do not spread manure directly before planting. Avoid low, wet areas. The threat of seed corn maggot diminishes greatly if the crop is planted after the third week of June. (This elayed timing can be effective on cucurbit crops as well)

Unfortunately this is a problem that has to be handled preventatively by using treated seed or in-furrow applications while planting. There are no known resistant varieties. Cultural practices to reduce infestations are the previously mentioned delay between incorporating cover crops and sowing seed, as well as planting more shallowly or using other means to speed up germination and emergence. Delaying the planting until the third week of June helps the crop miss the first generation of this pest, and at any time, transplants are less susceptible to damage than are seeds.

Resources:
https://extension.entm.purdue.edu/fieldcropsipm/insects/corn-seedcorn-maggot.php
https://www.cals.ncsu.edu/course/ent425/library/compendium/diptera.html



Seed corn maggot feeding injury to stem of bean seedling (top) and to emerging bean cotyledons (bottom). *Photo: U Minn Extension* https://www.vegedge.umn.edu/pest-profiles/pests/seed-corn-maggot

Sweet Corn Vigor and Stand Issues

Gordon Johnson, Extension Vegetable & Fruit Specialist, University of Delaware and Emmalea Ernest, Associate Scientist, Vegetable Crops University of Delaware (Source: Weekly Crop Update, Cooperative Extension University of Delaware, Vol. 24, Issue 10)

Each year we see sweet corn fields with stand and plant vigor issues, especially in early planted fields. There can be many causes for stand loss and weak seedlings: surface compaction and crusting, birds, soil insects, slugs, cold soils that delay emergence, soil diseases affecting seeds or seedlings, wet soils, fertilizer injury, deep planting, and herbicide injury are just a few examples.

When checking sweet corn fields with vigor and stand problems, it is important to dig up seeds and affected plants and examine the seed remnants, roots, and mesocotyl (stem that pushes the seed leaf to emerge above the ground). Corn seedling survival and early vigor is directly tied to a healthy seed kernel and mesocotyl from planting through the six leaf stage. Any damage to the seed or mesocotyl during this period can lead to stunted or weak seedlings, and in severe cases, seedling death. This is because the corn seedling depends on the seed for food to grow for several weeks after emergence until sufficient leaf area has been produced and nodal roots have become established. The seed kernel provides the means for early roots to grow and these food reserves are also mobilized and transported through the mesocotyl to grow the first stalk and leaf tissue. The mesocotyl also serves to transport water and mineral nutrients from the seedling roots.

Sweet corn is more susceptible stand loss and poor vigor problems than field corn because the seed has less food reserves. Shrunken types (supersweet, sugary enhanced, augmented shrunken, synergistic varieties) have even less stored food than "normal" types and therefore are more susceptible to stand problems.

I have looked at sweet corn fields with stand loss and vigor problems (uneven growth) over the years. Often, when digging up the seedlings and examining the seed remnants and mesocotyls, the kernels will be disintegrated and there will be darkening at the mesocotyl attachment. This means that the seeds deteriorated prematurely and the full content of the food reserves in the seed were not available for seedling development, leading to the stand and vigor issues. Premature seed deterioration and/or poor vigor seedlings can be due to diseases that cause seed rots, seedling blights and/or root rots. Soil insects can cause seed deterioration by feeding on seed contents or creating entrance wounds for disease organisms. In addition, certain soil insects and slugs can feed on the mesocotyl causing seedlings to collapse. Sweet corn that takes more than 10 days to emerge is at great risk of injury due to insects and diseases as seed treatments dissipate.

Cold stress and cold soils are common stress factors leading to poor stands. Often growers are pushing the limits and are planting sweet corn very early. In 2016 we have had a cool, wet spring which further stressed early sweet corn. While field corn will start to germinate at 50°F, many types of sweet corn seed much warmer soils. This is especially true of supersweet varieties and other shrunken types, which perform best at higher soil temperatures (above 60°F). When soil temperatures are below 55°F, germination is greatly extended. Food nutrients are mobilized in the seed but are not being utilized rapidly by the plant. The seed then becomes a perfect food source for many soil microorganisms. On a positive note, many of the newer sweet corn varieties have much more cold tolerance and emerge more rapidly in cold soils.

Stand issues are often related to the inherent poor vigor of sweet corn. Work with seed suppliers to obtain their best lots for early plantings with the largest seed sizes. Obtain varieties that perform better under cold stress. The University of Delaware has several years of data on fresh market and processing sweet corn varieties that were planted early under colder conditions to assess varieties for cold tolerance. Results can be found at http://extension.udel.edu/ag/vegetable-fruit-resources/vegetable-small-fruits-program/variety-trial-results/. The following fresh market varieties had good emergence in our mid-April planted trials: Celestial, Mattapoisette, Silver Duchess, Frosty (white kernels) and Obsession, Temptation, Temptation II, BSS0977, Xtra-Tender 274A, and Xtra-Tender 2171 (bicolor kernels).

Time to Put Up Sweet Corn Traps!

Teresa Rusinek, ENYCHP

Trapping moths is a useful tool for monitoring flights of key sweet corn lepidoptera pests, assessing pest pressure and timing sprays or releasing parasitoids. European Corn Borer (ECB) activity has been reported in Southern New Jersey and in the earliest sweet corn you may have to take action earlier than you think. ECB are attracted to the most advanced corn plantings when they emerge, often this is corn grown under plastic or rowcover. In our region ECB overwinter in corn stalks or in weeds in field borders, they typically emerge late May to early June.

Most areas have both strains of ECB: Iowa-E-I and NY-Z-II. Over the next two weeks we will be setting traps in representative sweetcorn fields throughout Eastern New York. We will be reporting moth catches in this weekly newsletter to give growers a general indication of pest pressure in various parts of the region. Having your own set of traps, in your fields along with regular scouting is the best way to monitor for these pests. If you are interested in placing traps on your farm, you can order net and bucket traps as well as pheromone moth lures from Great Lakes IPM, http://www.greatlakesipm.com/ or Gemplers http://www.gemplers.com. Typically we put out three heliothis net traps, two for each of the ECB strains and one for Corn Earworm which will be flying up from the south in a few more weeks. You may also want to monitor for Western Bean Cutworm and Fall Armyworm. Green bucket traps work well for these moths. If you need help ordering these items feel free to email me tr28@cornell.edu or call 845 691-7117

The following is excerpted from NYS IPM "Season Insect Control in Sweet Corn when using Row Cover", By John Meshanic-2004

Over the years, IPM techniques and recommendations for the control of insect pests on sweet corn have developed from research by Cornell faculty, Cooperative Extension educators and growers trying different ideas. For early corn (Corn maturing before the first week of August), the IPM recommendation is to scout the field, and if over threshold, apply a control when the corn is just coming into tassel. Sweet corn growers found out the hard way this technique did not work with row-cover/plastic sweet corn. Because the row-cover/plastic corn is so much more advanced than all other corn around, ECB adult moths are attracted to that corn first. Larvae are deep in the plant and even if it is scouted, signs of the larvae is nearly impossible to find. **If row cover/spastic corn is sprayed at tassel, it is too late and larvae damage will be found on the corn.** It makes sense to time sprays on the corn when insect activity is present. By having pheromone traps next to fields and monitoring those traps, it is possible to know when ECB moths are laying eggs. Normally the eggs hatch three to six days after deposition. The goal is to make a spray application when the eggs hatch but before the larvae dig deep into the plant. If you know when the ECB flight is heavy then it is possible to predict when the most number of eggs will be hatching on the corn plants.

For best results, the ECB E and ECB Z traps should be set at least 50 feet from each other and do not cross contaminate pheromone lures when servicing traps.

More Maggots! Onion Maggots are at Peak Flight

Crystal Stewart, ENYCHP

Yes, maggot season is upon us, like clockwork. As Amy notes in her article, seedcorn maggots are wreaking havoc on many crops (including onions), but it is also peak flight for onion maggots, which are primarily restricted to alliums. How do we know it's peak season? We are using growing degree day models. Lucky for us (and for you, if you want to be making predictions and applying preventative controls such as exclusion or late planting), NEWA provides model calculations for each of its weather stations for pests ranging from onion maggot to alfalfa weevil. Go to newa.cornell.edu, use the pest forecast dropdown menu, and you can receive predictions based on your closest weather station. No math needed!

Because we are already in peak flight, exclusion of maggots is not a good strategy at this point. Rescue sprays are no longer recommended, either—the strategies which are best at this moment are to rely on in-furrow or seed treatments applied at planting, or timing planting as the first flight subsides (this moment is quickly approaching, and may be here in the south). Currently unprotected crops are very at risk if pressure is high, and there is little to be done about it.

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"**How much is too much?"** *Note from Maire Ulrich*

Due to the spates of dry weather in Orange, slightly after planting, Maggot insecticides may not be as effective as you would like.

Damage from 3% to 5% is very normal for conventional production in intensive onion areas. From 5% to 10% is approaching failure. Anything above 10% is failure in some fashion.

To calculate damage, count 10 onions in a row in 10 random places in the field. Because maggot females fly from plant to plant in a row it is common for many onions in a row to be attacked so it's important to randomly (close eyes, throw a stone) select where you count to get an accurate assessment.

Note that bulb mite feeding may attract maggots and vice versa so look to see if there is co-feeding. So if you have high levels of damage from maggot you want to see if mites are involved as well. Also, on the surface, it is difficult to differentiate maggot from mite damage.

Onion
Adult.
Omafra

One of the best strategies for managing maggots in general is to understand the ecology and prevent problems. As Amy noted, excessive organic matter is attractive to flies and, therefore, maggots. With onions another important strategy is sanitation. If maggot issues continue to get worse for you, make sure to destroy crop residue and culls in the field this winter. The reason for this is that you can starve the third generation before they pupate in the field, readying to become next year's flies. Crop rotation is also essential. Move onions are far as possible from previous plantings.

UMASS reference of GDD for peak flights of key maggot fly pests
using seasonal degree day accumulation

Base temp. 40 deg F

Generation	Seed Corn	Onion	Cabbage
1st Peak	200	700	250
2nd Peak	600	1960	1475
3rd Peak	1000	3240	2650

Sources:
Seedcorn: University of Minnesota
Onion: NYS NEWA
Cabbage: NYS NEWA, Jyoiti & Shelton

Colorado Potato Beetle (CPB) Management

Dan Gilrein and Sandra Menasha

Selected from *Long Island Fruit & Vegetable Update May, 26, 2016*

In Eggplant, Peppers and Tomatoes:
CPB can be very damaging to young transplants, chewing on stems and foliage. Eggplant and tomatoes are especially at risk but I have also seen damage to peppers. Field applications of Admire Pro/generics at transplanting (e.g. drench water) may help where populations are not resistant; post□plant spray options are limited and include Kryocide (larvae only on tomato and eggplant) (14 DTH, min. 7 days between applications) – best applied when dry weather is expected to avoid wash-off. Agri-Mek, Assail, Radiant and Entrust are also labeled for all. For relatively small plantings hand removal or knocking insects off into a container may be an option. Rotation helps: avoid planting near overwintering sites at the sides of fields.

In Potatoes:
A few beetles were spotted over the last couple days. As we get into warmer temperatures we can expect activity to increase over the next week. Growers should begin to prepare and think about a management plan considering not only beetle management but resistance management as well. To control small to medium larvae Radiant, Rimon, Blackhawk and Kryocide are recommended. If using Kryocide, maximum effectiveness is achieved with a minimum 3□4 day rain□free interval after application. Rimnon is best used on small, first generation larvae. Blackhawk (a.i. spinosad) and Radiant (a.i. spinetoram) are in the same chemical class (Group 5) so, if you are experiencing or suspect resistance to Radiant, resistance to Blackhawk is likely. Remember we now have a Special Local Needs label for use of Rimon to control Colorado potato beetle. You must have a copy of the SLN label when using Rimon http://128.253.223.36/ppds/535376.pdf. *Effective if timed well for 1st and 2nd stage larvae. Expect poorer results otherwise.* Use 12 oz/A rate (but no less than 9 oz/ A), followed by a second application after 7 days. Best results will be against the first generation in spring. Note application restrictions on the SLN label, including maximum 3 applications and 24 oz/A per year, the pollinator advisory, a 300' buffer strip to water, for ground application only, and need to avoid drift to grapes (due to leaf spotting). Large larvae are more difficult to manage as not all registered products on Long Island provide effective control. Assail will provide good control of large larvae and should therefore be considered later in the season as more of a clean-up spray to manage larvae not controlled in any earlier insecticide applications. If Admire was used at planting it is better to avoid Assail if possible from a resistance standpoint, especially on the second generation. If conditions permit, consider Kryocide instead. Kryocide has also performed well on large larvae in trials, similar to that achieved with Assail. For control under organic management, timing is critical. There are no materials registered that will work well or even fair on large larvae so growers need to be out scouting to time applications with egg hatch. Entrust (OMRI) will provide good control where resistance has not been reported. Azera (OMRI) is a newer product which combines the active ingredients azadirachtin and pyrethrin and has provided good control of small larvae in our trials. For best results, apply materials at the highest labeled rate targeting small, newly hatched larvae. A second application, 5-7 days after the first, may be necessary to optimize the level of control. Other management practices include hand picking where appropriate, row cover, bug vacuums, flaming and trench trapping.

Angular Leaf Spot: Perennial Problem of Cucurbits

Chuck Bornt, ENYCHP

Every year the first disease that we see in cucurbits, particularly summer squash under row covers, is Angular Leaf Spot, a bacterial disease caused by *Pseudomonas syringae*. Initially leaf symptoms appear as small, irregularly shaped, water-soaked lesions. The spots expand until they are limited by larger veins, giving them the angular appearance which the disease is named for. Under our current humid conditions, the water-soaked spots can be covered by a bacterial ooze, which can dry and give the leaf area near the spot a crusty appearance. This can also happen on the underside of the leaf. As the spots dry, they shrink and tear away from the healthy tissue leaving large, irregular holes and giving the leaf a ragged appearance. Squash and watermelon leaf lesions are more variable in size than cucumber lesions which are usually smaller. The squash and melon lesions can be surrounded by a yellow halo. Lesions can appear on the fruit as well, but will be more circular and are smaller than on the leaf. If left untreated, the ALS lesions will crack open, allowing secondary fungi and bacteria to invade possibly resulting in a slimy, foul-smelling fruit rot.

The *Pseudomonas* bacterium is a seedborne pathogen, but it can also overwinter in infested crop residues. The disease is widespread and is especially damaging when there are extended and frequent summer rains when daily temperatures range between 75 and 82° F. The warm, moist conditions under row covers tend to be perfect for disease development. Dry conditions, caused by either dry weather or the removal of row cover, tend to slow or stop the disease, once it's present. Of course, prevention is the best cure.

Strive to plant certified, pathogen-free seed. There are resistant cucumber varieties, but no squash or melons are resistant. A cucurbit rotation should avoid replanting in the same field for at least 2 years as the bacteria can survive for that same duration. Do not over fertilize and avoid overhead irrigation as well as handling plants while they are wet. This includes cultivation, harvesting etc. Harvest clean plantings first and any infected plantings last as this will help slow the pathogen down. Plow under or burn infected crop debris immediately after harvest. Apply copper along if organic or with fungicide like mancozeb that can protect from secondary infection. Copper will help slow disease spread during particularly wet periods but can be dropped if dry weather continues for 2 weeks. *–Edited by Crystal Stewart*

Left: Zucchini with lower leaves infected. Right, close-up of disease symptoms. Images: Chuck Bornt

ENYCH Program Educators:

Fruit

Dan Donahue
Phone: 845-691-7117
Email: djd13@cornell.edu
Tree Fruit

Anna Wallis
Phone: 443-421-7970
Email: aew232@cornell.edu
Tree Fruit & Grapes

Laura McDermott
Cell: 518-791-5038
Email: lgm4@cornell.edu
Berries

James O'Connell
Phone: 845-691-7117
Email: jmo98@cornell.edu
Berries & Grapes

Vegetables

Chuck Bornt
Cell: 518-859-6213
Email: cdb13@cornell.edu

Amy Ivy
Phone: 518-561-7450
Email: adi2@cornell.edu

Teresa Rusinek
Phone: 845-340-3990 x315
Email: tr28@cornell.edu

Erik Schellenberg
Phone:845-344-1234
Email:js3234@cornell.edu

Crystal Stewart
Cell: 518-775-0018
Email: cls263@cornell.edu

Maire Ullrich
Phone: 845-344-1234
Email: mru2@cornell.edu

Business and Economics

Jesse Strzok
Phone: 518.429.1464
Email: js3234@cornell.edu

Content Editor: Erik Kocho-Schellenberg
Layout: Abby Henderson

Veggie Compass Update

Jesse Strzok, ENYCHP

I'll keep this note as short and sweet as possible – Veggie Compass 2016 was released earlier this year with major changes including the ability to calculate gross and net income per square foot (or acre) for all crops as-well-as an average across all crops. Along with the software update, the new user manual is available as a pdf. Go to www.veggiecompass.com to download the latest update.

For more information, contact Jesse Strzok – js3234@cornell.edu