



UMass  
Extension

# Vegetable Notes

For Vegetable Farmers in Massachusetts since 1975



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## CROP CONDITIONS

CSA farms are perfecting the art of displaying their cornucopia this time of year. Pick up locations are bountiful with bunching onions and leeks, broccoli, cabbage, beets, salad and cooking greens, cucumbers, summer squash and zucchini, fennel, escarole, endive, etc... Wholesale growers are busy preparing loads of cucumber, summer squash, and zucchini. One wholesale grower was selling their greenhouse tomatoes for \$15-25 per box, depending on the size and quality. Because of the high heat a few weeks ago, they unfortunately have more \$15 boxes of tomatoes with yellow shoulder than they would like. See the article in this issue for more on physiological disorders of tomato, including yellow shoulder. Eggplant and field tomatoes are starting to come in now as well.

We have noticed a few weedy corn and pumpkin fields around the state. Pre-emergent herbicide applications failed in some instances due to lack of rain to wash the materials into the soil. If the label recommends 10-30 gallons of water be applied with the herbicide, and rain is not expected for the next 5 days, use the higher water rate. Some labels will also recommend light cultivation to incorporate of the material if rain is not expected.

With warm, humid days and cool nighttime temperatures, we've been seeing a lot of morning dew and we can soon expect the diseases that are associated with long periods of leaf wetness, like alternaria leaf spot in brassicas and cercospora leaf spot in Swiss chard and beets. The storm on Tuesday brought the soaking rain many of you have been waiting for, though it may also have brought other goodies up from the south, such as migratory pests like cucurbit downy mildew, cabbage looper, and corn earworm.

## PEST ALERTS

### **Alliums:**

**Onion thrips** pressure remains high and damage is severe in untreated fields across the region. Thrips feeding causes whitish flecks, curling, and bending of the leaves that can reduce plant vigor and bulb size. Wounds produced by their feeding provide entry points for bacteria, which can later cause bulbs to rot in storage. There are many effective insecticides, both organic and conventional, that can be used to control thrips populations. Find them listed here: <http://nevegetable.org/crops/insect-control-14>. Include a spreader/sticker to help the spray stick to waxy allium leaves.



*Cornucopia in Berkshire Co., MA.  
Photo: K. Campbell-Nelson*

### **Brassicas:**

**Brassica caterpillars:** Imported cabbageworm and diamondback moth are causing damage now in brassicas. Scout plants (about 25 across the field) for caterpillars or their frass and treat if you find at least one caterpillar on 35% of young plants, 20% after the start of head formation for heading crops and 10-15% for leafy greens like kale and collards.

**Flea beetles:** Remain active, with new adults emerging from soil in brassica fields. Non-heating row covers (e.g. Pro-

teknet) can provide excellent protection of the crop even during summer heat if secured well at the edges. Incorporate crops immediately after harvest to expose and kill larvae and pupae in the soil.

### Beans:

[Mexican bean beetle](#) larvae are hatching now. Small larvae cause defoliation and may cause damage to pods. There are 1 to 3 generations per year in New England, and the population can increase over the season with newly emerging adults moving to the next succession of beans. Annual releases of the larval parasitoid *Pediobius foveolatus*, timed to coincide with egg hatch, can help control beetle larvae. The wasp will not survive our winters, so must be re-released each year, but does reproduce and move into later plantings within the same season. For more info see: <http://ag.umass.edu/vegetable/fact-sheets/mexican-bean-beetle-biological-control>.

[Potato leafhoppers](#) numbers are high in untreated beans and we are seeing a lot of hopperburn now (see photo). In beans, if feeding damage is severe the plants may stop pod production and existing pods develop incompletely. For organic and conventional control options see the [New England Vegetable Management Guide](#).

### Cucurbits:

**Bacterial wilt** symptoms are now being seen in cucurbit crops across the region. The bacterium is vectored by striped cucumber beetles and causes rapid wilting and collapse of plants or vines. Importantly, bacterial wilt usually does not cause the leaves to turn yellow then collapse; the foliage stays green.

**Yellowing and collapse of plants** is being seen across the region, though we have yet to identify a cause. Symptoms differ from bacterial wilt in the yellowing of leaves and rapid collapse of the plant. Winter squash, pumpkin, summer squash, and zucchini have been affected. For now, roguing out suspect plants may help prevent spread of a potential bacterial or fungal pathogen. We will keep you updated as diagnoses come in.

[Squash bug](#) nymphs are now hatching across the region. When targeting nymphs, the threshold is more than one egg mass per plant, and when nymphs are first seen. When targeting adults, the threshold is 1 adult per 2 plants in susceptible crops, or 1 adult per plant in less susceptible crops such as watermelon.

[Squash vine borer](#) trap counts are declining, indicating that peak flight is over in MA and egg-laying is occurring now (see map on next page). No damage has been observed yet in MA but is being seen now in CT.

[Powdery mildew](#): Symptoms are just starting to show up on cucurbit crops across the region. Start spraying susceptible crops when 1 leaf in 50 shows disease symptoms. This pathogen develops resistance to fungicides quickly so make sure to choose carefully and rotate classes with each spray. See the [June 21, 2018](#) issue of Veg Notes for updated spray recommendations for this year.

### Solanaceous:

[Tomato hornworm](#) caterpillars were found this week in tomato crops across MA and also in pepper in RI. Scout by searching leaves for damage, frass, or larvae. Often one sees defoliated stalks or the characteristic dark-green fecal droppings (frass) before the caterpillar is located. There is no set economic threshold for this pest in tomato. Where damage is unacceptable, or if there are high numbers, foliar sprays can be used. Use a selective material that will conserve beneficial insects, because those predators and parasites are very likely keeping your aphid populations under control. Insecticides include *Bacillus thuringiensis* (Bt) *kurstaki* or *aizawi* strain (Dipel DF, Agree, or Xentari, etc.), indoxycarb (Avaunt), tebufenozide (Confirm 2F), or spinosad (SpinTor 2SC or Entrust). Several synthetic pyrethroids are also labeled (note: these could result in aphid outbreaks). Although Bt usually works best on small larvae, in this



*Cabbage plants stunted from flea beetle damage show where row cover ended. Photo: S. Scheufele*



*Hopperburn in bean*

case it will work very well even against large hornworms. In peppers, any controls used for European corn borer should control hornworms.

**Flea beetles** (FB) are continuing to cause severe damage to eggplant and tomato this year. This week we saw severe damage in a greenhouse tunnel tomato crop. Full size plants rarely require treatment for flea beetles. Most insecticides registered to control CPB, including spinosad, will control FB. The grower with the greenhouse outbreak will use yellow sticky cards placed in the canopy to try to trap out as many beetles as possible and reduce damage that way.



*Extensive flea beetle damage on high tunnel tomatoes.  
Photo: S. Scheufele*

**Powdery mildew** is popping up again in tunnel and greenhouse tomatoes around the region. Tomato powdery mildew is a different pathogen than the powdery mildew that attacks cucurbits. This pathogen is favored by low light and cool conditions (below 86°F). Improve air circulation and light penetration by pruning and staking, increasing plant spacing, and using fans and vents to lower humidity. The following varieties are listed as having resistance to powdery mildew: Climstar, Frederik, Rebelski, and Striped Stuffer for slicer types and Indigo Rose and Granadero for plum types.

**Pepper maggot** flies are beginning to lay eggs, and oviposition scars have been seen in Cherry Bomb peppers, a preferred host, in Middlesex Co., MA this week. For information on chemical and cultural control options see last week's issue of Veg Notes: [http://ag.umass.edu/sites/ag.umass.edu/files/newsletters/july\\_12\\_2018\\_vegetable\\_notes.pdf](http://ag.umass.edu/sites/ag.umass.edu/files/newsletters/july_12_2018_vegetable_notes.pdf).

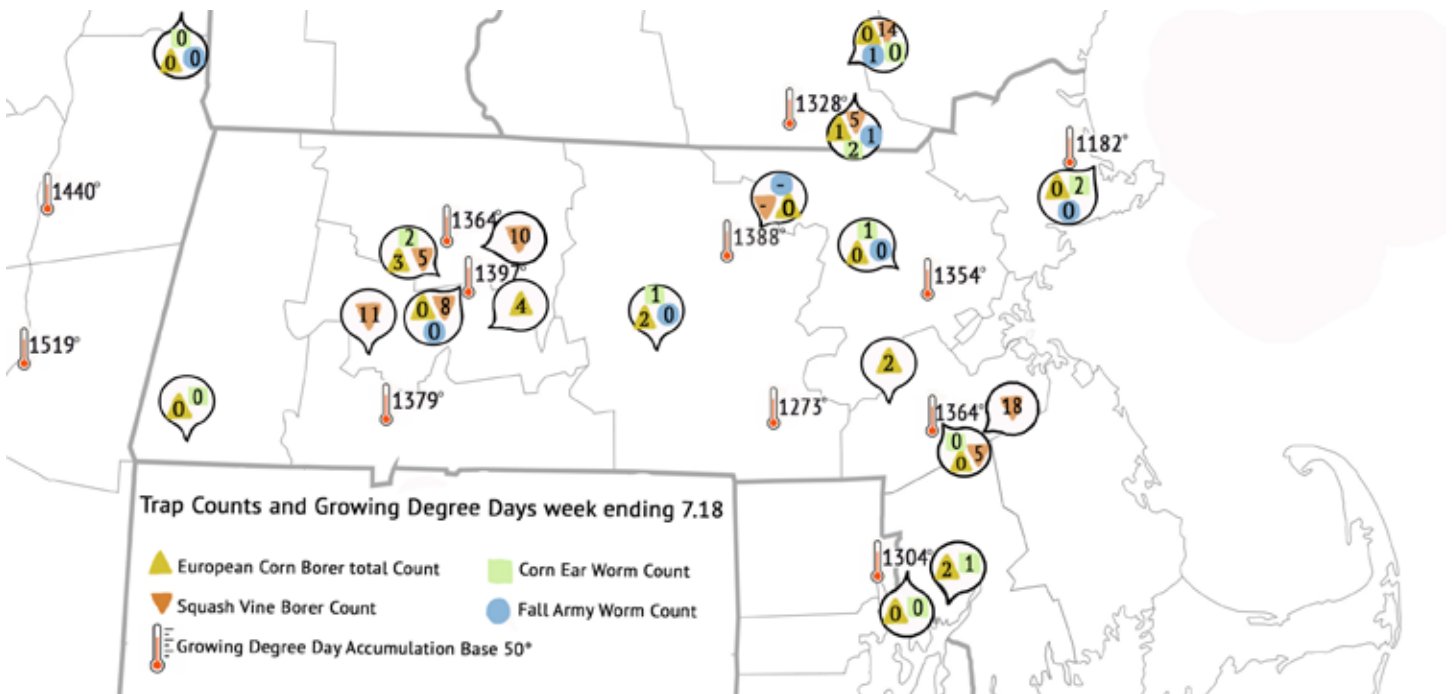
**Sweet Corn:**

**Corn earworm** numbers are up a bit this week due to storm fronts bringing the pest in, though total captures remain low and most locations still do not require any spray (see table for spray intervals).

**European corn borer** captures are up, indicating the beginning of the second generation flight at 1,400 GDD base 50°F. Silking corn still 5 days from harvest should be scouted now and treated if there is an infestation of 15% or more ECB or FAW.

**Fall Armyworm** (FAW) is being caught in a few locations in MA and NH. FAW does not overwinter in New England. Infestations result from moths carried northward on storm fronts from

Spray Intervals for corn earworm based on moth captures in heliothis net traps.		
Moths/Night	Moths/Week	Spray Interval
0 - 0.2	0 - 1.4	no spray
0.2 - 0.5	1.4 - 3.5	6 days
0.5 - 1	3.5 - 7	5 days
1 - 13	7 - 91	4 days
Over 13	Over 91	3 days



southern states from mid-July into September. Flights are heavier near the coast, but move inland as well. The flights are sporadic and difficult to predict, and do not necessarily correspond with corn earworm flights, so monitoring with pheromone traps in whorl stage corn is very useful.

**Sap Beetle:** While caterpillar pests have not been much of a problem yet this season in sweet corn, some growers are treating their corn for sap beetle larvae, which peak in July. Varieties with well covered tips are more protected. Do not leave infested blocks standing and mow aggressively to chop ears as soon as the block is finished. See article this issue for more management recommendations.

## **ABIOTIC DISORDERS OF TOMATO**

This year, we saw stretches of cool weather in May, when high tunnel tomatoes began flowering and fruiting, leading to cat-facing in the first ripe fruit. Now, we are having hot and humid weather, and field tomatoes are struggling with other fruit disorders. Here are some of the disorders we have seen over the past few years, with identification tips and management strategies:

**Catfacing** is a physiological disorder of field and greenhouse tomatoes. Tomatoes are considered “catfaced” if the blossom scar is enlarged or perforated. Often times, the fruit becomes extremely misshapen, but fruit distortion is not necessary to classify it as “catfaced”. This disorder has not been extensively researched and is not fully understood. Cold temperatures during flowering have been shown to increase incidence of catfacing, as have extreme fluctuations in night versus day temperatures. Damage from thrips to the side of the pistil of tomato flowers can also cause this disorder, and under some conditions, pruning and high nitrogen levels can increase catfacing incidence. Catfacing can increase chances of fruit becoming infected via the rough blossom scar by black mold rot, a disease caused by several different fungi. **Management:** Avoid excessive pruning and nitrogen fertilization. Avoid low greenhouse and high tunnel temperatures for both greenhouse tomatoes and transplants. Do not plant high tunnel tomatoes too early if you cannot provide supplemental heat. Use cultivars that are less prone to catface—heirloom tomatoes tend to be more prone to this disorder than non-heirloom varieties.



*Catfacing*

**Leaf roll** is often seen just after plants are heavily pruned during dry soil conditions, but oddly enough, leaf roll disorder also has been found to be caused by excess soil moisture coupled with extended high temperatures. If the tomato plant’s top growth is more vigorous than root growth and we are hit with a dry hot period, the foliage may transpire water faster than the root system can absorb it from the soil. In order to conserve water, the plant will roll up its leaves to reduce the surface area from which water can evaporate. Leaf rolling can also result from growing high-yielding cultivars under high nitrogen fertility programs. Cultivars selected for high yield or early ripening tend to be the most susceptible and indeterminate varieties are more sensitive than determinant. The good news is that leaf roll rarely affects plant growth, fruit yield, or fruit quality. Some viruses can look similar to tomato leaf roll, but if the symptoms appear suddenly, involve many of the plants in a field, and largely affects lower leaves, it is probably just physiological leaf roll. **Management:** Reduce symptoms by maintaining consistent, adequate soil moisture (~1 inch per week during the growing season, which will also help with calcium up-take, reducing blossom end rot problems). Do not prune heavily during hot, dry conditions or over-fertilize with nitrogen.



*Leaf curl. Photo: C. Steinberg*

**Stitching/Zippering** is the term for when a thin, brown, necrotic scar extends from the stem scar to the blossom end on fruit. The longitudinal scar has small transverse scars along it, making it resemble a zipper or seam. Fruit can have one or several scars. This disorder does not affect the edibility of the fruit, but may render fruit unmarketable. Zippering is caused by anthers (the pollen-producing flower part) fusing to the ovary wall of newly forming fruit. This disorder occurs more frequently in cool weather. **Management:** Plant varieties that are less susceptible to stitching/zippering. Avoid low greenhouse temperatures.



*Stitching or zippering*

**Yellow shoulder:** Liz Maynard of Purdue extension wrote about the following three causes of yellow shoulder in tomatoes: “**Genetics:** Varieties that have green shoulders in immature fruit are more likely to show the disorder. If you aren’t sure whether a variety has the gene for green shoulders, check with the seed supplier, or review the tomato cultivar descriptions available from the North Carolina State University site at <http://cuke.hort.ncsu.edu/cucurbit/wehner/vegcult/vgclintro.html>. **High Temperatures/Sun:** Yellow shoulders are often found on tomato fruit exposed directly to the sun. On plants pruned to a single stem there may be many fruit in this situation. Loss of foliage due to disease can also expose fruit to the sun. If tomato fruit gets extremely hot it may exhibit sunscald, with the skin and flesh turning white and sunken on the exposed area of the fruit. Covering plants when the first fruit begin to ripen with shade cloth whether in the field or over a high tunnel can reduce temperature and shield fruit. **Nutrition:** Inadequate potassium is linked to this disorder. Research in processing tomatoes has shown that adequate potassium early in tomato plant development is necessary. Soil conditions that influence potassium availability, such as levels of magnesium and calcium are also a factor. The ‘[Hartz Ratio](#)’ calculator at Ohio State University provides a way to assess risk of the disorder in processing tomatoes based on soil properties.” **Management:** Plant cultivars without the tendency for “green shoulders”, use shade cloths over tunnels and greenhouses when fruit begins to form, and maintain adequate levels of K fertility throughout the season. If you currently still have green tomatoes in your tunnel or greenhouse, using shade cloth when temperatures are projected to top 95°F can still help you avoid yellow shoulder.



*Yellow shoulder. Photo: P. Bachi*

Jerry Brust, IPM Vegetable Specialist at the University of Maryland, researches the management of abiotic disorders in tomato; he recommends using white plastic mulch laid early in the season to keep the crop cooler and using shade cloth on your most marketable varieties. In over 5 years of trials, Brust’s research has shown that a 30% filtering shade cloth increases marketable yields by 20-50%, depending on the year. A 4ft-wide shade cloth covering even a quarter of the crop canopy is sufficient to achieve this increase in yield, and the cloths may be used for many years. Other general recommendations for improving tomato health and avoiding abiotic disorders include maintaining a healthy root system, raising soil pH above 5.2, and providing even irrigation throughout the season (particularly during fruit set).

*--Compiled by G. Higgins and K. Campbell-Nelson from the following sources:*

*Brust, Jerry, IPM Vegetable Specialist, University of Maryland; [jbrust@umd.edu](mailto:jbrust@umd.edu). “Other Fruit Problems with the 2016 Tomato Crop” Weekly Crop Update, Delaware Cooperative Extension. August 26, 2016.*

*Johnson, Gordon, Extension Vegetable & Fruit Specialist; [gcjohn@udel.edu](mailto:gcjohn@udel.edu) “Blossom End Rot Now Showing Up”. Weekly Crop Update, Delaware Cooperative Extension. June 26, 2015.*

*Maynard, Liz, Assistant Professor of Horticulture, [emaynard@purdue.edu](mailto:emaynard@purdue.edu), 219-531-4200. “Yellow Shoulder and internal white tissue in tomatoes” Veg Crop Hotline, Purdue Extension. August 7, 2014.*

*Scott, J.W. 2014. “Zippering” and “Catfacing”. Compendium of Tomato Diseases and Pests, 2nd ed., eds, J.B. Jones, T.A. Zitter, T.M. Momol, and S.A. Miller.*

# **FRUIT AND FRUITING DISORDERS IN SUMMER SQUASH AND CUCUMBERS**

By Gordon Johnson, Extension Vegetable & Fruit Specialist; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)  
Originally published in the University of Delaware Weekly Crop Update, July 14, 2017

A number of fruit and fruiting disorders have been observed in summer squash and cucumbers over the last two weeks including lack of fruit set, bottlenecking, pinched blossom ends, crooks, nubs, hollow centers or cavities, fruit zippering and scarring.

Lack of fruit set can result from a lack of pollination due to reduced bee activity, reduced pollen viability, or reduced pollen germination in high heat. Water stress will compound this problem. When day temperatures are in the 90s and night temperatures are in the high 70s, plants will commonly abort fruits or produce misshapen fruits. To reduce losses due to heat, apply irrigation so that plants are never under water stress.

Growers should note that some squash (mostly zucchini) varieties will still set fruit without pollination. Steve Reiners at Cornell did a trial in 2013 with 21 varieties of summer squash to determine which were capable of setting fruit without pollination. Female flowers were bagged prior to opening to exclude pollinating insects. After 1 week, bags were removed and fruit rated as to whether it was marketable or not. The results can be found at this web site: <http://www.hort.cornell.edu/expo/proceedings/2014/Vine%20crops/Seedless%20squash%20Reiners.pdf>. For example Golden Glory and Dunja zucchini both were able to set a high percentage of fruit without pollination. Selecting varieties with this ability can reduce losses due to poor pollination.

Parthenocarpic varieties of cucumbers and zucchini that set fruit without pollination are also available and can be less susceptible to environmental extremes or conditions that limit bee activity in monoecious or gynoecious varieties. We currently are evaluating 17 parthenocarpic pickle varieties for adaptation to our region.

Lack of fruit set can also be due to harvest management. When summer squash or cucumbers are allowed to progress to an overly mature stage, plants will “shut down” and not reflower for a period of time. To manage this problem, frequent picking (every 2-3 days) is necessary.

Misshapen fruits commonly are found in high numbers with high temperatures and water stress in the summer or low night temperatures in the fall. This includes bottle necking, pinched blossom ends, crooked fruits or fruits with “narrow waists”. These defects are most commonly due to effects on pollination. Other stresses such as herbicide injury, root pruning in cultivation, or wind damage can increase the number of misshapen and unmarketable fruit. Potassium deficiency can also cause pinching at the stem end.

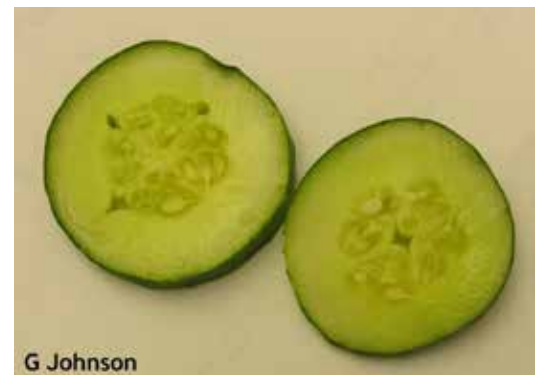
Hollowness or open cavities in cucumber and summer squash fruit can be caused by inadequate pollination and reduced seed set. Boron deficiency or the combination of boron and calcium deficiency can also result in increased hollowness.

## **SAP BEETLES IN SWEET CORN**

Sap beetles have generally been thought of as secondary pests of sweet corn, usually associated with damage caused by caterpillars, but on some farms they are a regular and troublesome pest in early sweet corn plantings – even where caterpillars have been non-existent! Early sweet corn varieties tend to have poor tip cover, allowing sap beetle adults to lay



*Progression from marketable to unmarketable pickle fruits that are crooked, waist pinched, tip pinched or tip pinched with crook.*



*Small cavities in cucumber fruit. In a more severe form hollowness and cavities can render the fruits unmarketable or reduce processing (pickling) quality.*

eggs near the tip, where tiny larvae burrow into the kernels, and make the ears unmarketable (see photo). Sap beetle adults have already been observed in early corn plantings in MA, so now is the time to be scouting if this pest has been a problem on your farm in past years. Sap beetles can also be pests of strawberry and other fruits, so they tend to be more of a problem on farms that grow both fruit and corn. The beetles are attracted to decaying plant material, particularly fruit. Growers with sweet corn plantings that are close to peach or apple orchards, where over-ripe dropped fruit can attract adult beetles, are vulnerable to invasions into corn, and should pay particular attention for this pest when scouting. Sap beetle infestations tend to be worse in hot, dry years.

**Life Cycle and Damage.** Sap beetles overwinter as adults, often in the woods near previous feeding sites. Early sweet corn silk is an attractive early-season feeding and egg-laying site, especially when fruits and other hosts are rare. There are several generations per year. The most common sap beetles in corn are the dusky sap beetle (*Carpophilus lugubris*), which is black and plain (3.5-4.5 mm long), and the four-spotted sap beetle (also known as picnic beetle, *Glischrochilus quadrisignatus*) which is black with four irregular yellow spots (5-6 mm long). The most common species in strawberries is the strawberry sap beetle (*Stelidota geminate*).

Adults are first noticeable about the time that tassels and silk appear. They may also move in closer to harvest, when kernels fill and silks are dried or decaying. They may invade corn borer tunnels or areas with other insect or bird damage, but are also found in corn that is free of caterpillar damage. They lay eggs in silks and the tip of ears. Eggs are milky white and resemble tiny grains of rice. The larvae are small, pinkish white or creamy colored grubs about ¼ inch long. They may hollow out kernels of the upper half of the ear, making ears unmarketable. Adults may also hide between the layers of the husk. The problem can easily be overlooked until harvest, when adults show up in harvest bins, and larvae are found in the ears.

**Monitoring and sprays.** Scout for sap beetles when silks begin to wilt, and scout regularly until harvest. Inspect the silk area at the tip and the husks of 50-100 ears across the field, and determine the percent of ears infested with adults, eggs, or larvae. Sprays for other ear pests usually control sap beetles, but if other pests are absent and more than 10% of ears are infested with sap beetles, treat for sap beetles. Sprays in the final 7-10 days before harvest may be needed if sap beetles are present at that time – timing is important. Pyrethroids used to control European corn borer (ECB) and corn earworm (CEW) infestations will reduce sap beetle, but if populations are high, a combination of pyrethroid and methomyl (Lannate) may provide additional control. Bt hybrids that produce Bt toxin at the cellular level do not protect against sap beetles, so you may need to spray even in the absence of ECB and CEW in those plantings.

Spray trials conducted by Gaylon Dively of UMD indicated that sprays on the 3rd and 6th days of silk were most effective, and additional, later sprays did not improve control. Efficacy trials have shown that carbaryl (Sevin), lambda-cyhalothrin (Warrior II), bifenthrin (Bifenture), and methomyl (Lannate) are more effective than most other insecticides. However, carbaryl cannot be used during the early silk period while corn is shedding pollen and does not allow for hand harvesting after use. When spraying for sap beetle please consult the labels and try to spray in such a way as to protect bees.

**Cultural practices.** Ears with exposed tips, especially super sweet and Bt varieties, are especially susceptible to infestation. To prevent or reduce damage, select varieties that have good tip cover, use clean cultivation, and control ear-infesting caterpillars. Sanitation is important to prevent successful overwintering and reproduction during the season. Bury corn residue, especially decomposing ears; remove or bury alternate hosts such as rotting tree fruit or discarded vegetables on a regular basis but especially in the fall to reduce the size of the overwintering population. Burial should be deeper than 10 cm.



*Sap beetle larvae and damage.*  
Photo: E.E. Nelson



*Four-spotted sap beetle adult.*  
Photo: A. Hazelrigg

--R. Hazzard and S. Scheufele

# **EVENTS**

## **Twilight Meeting Summer Series**

This series of Twilight meetings is an opportunity to learn from fellow farmers and find out what's new in Extension research. A light meal will be provided at each program.

### **Organic Weed Management**

**Featuring:** Langwater's Kevin O'Dwyer and their flame weeder and leaf mulching techniques. Invited presenters include: Katie Ghantous (UMass Vegetable Weed Technician) with a vinegar weed injector, on-farm trial and information on weed ecology; Sonja Birthisel (UMaine PhD candidate studying Weed Management) with results of her research using occlusion and solarization, and farmer Tyson Neukirch with his experiences using silage tarps in a reduced tillage system for weed management.

**When:** Tuesday, July 24th, 2018 from 4:00 pm to 7:00 pm

**Where:** Langwater Farm, 209 Washington St., North Easton, MA 02356

**CLICK HERE TO REGISTER:** <https://www.surveymonkey.com/r/X9WLFYS>

[Click here to request special accommodations for this event.](#)

### **UMass Extension Vegetable Program Research Tour and Round Table**

**Featuring:** Sue Scheufele's research on cucurbit downy mildew resistance, pollinator protection in butternut squash, effects of different mulches on broccoli pests, and natural predators of cabbage aphid. Also, Madelaine Bartlett's research on corn genetics and the importance of genetics in crop development and improvement, Omid Zandvakili's research on lettuce nutrition, Kelly Allen's research on Fusarium wilt of basil, presentations on pollinators & agriculture and solar & agriculture, and more! Research presentations will be followed by dinner and a round table discussion.

**When:** Tuesday, August 14th, 2018 from 4:00 PM to 7:00 PM (Rain date: August 16th)

**Where:** UMass Crop and Animal Research and Education Farm, 89-91 River Rd., South Deerfield, MA 01373

**CLICK HERE TO REGISTER:** <https://www.surveymonkey.com/r/X3JYR55>

[Click here to request special accommodations for this event.](#)

### **Reduced Tillage and Transplanters for Vegetable Farmers**

**Featuring:** Farmer Jim Ward and his reduced till vegetable cropping systems which he has practiced for over 10 years with the help of an Unverferth Deep Zone Tiller, Davidian Farm's two-row Monosem vacuum precision planter mounted with Dawn Biologic roller crimpers (first ones in the state!), the UMass Research Farm's grain drill and roller crimper, and Brookdale Fruit Farm's new line of no-till transplanters from Checchi-Magli. There will also be demonstrations on Soil Health with Maggie Payne, Soil Scientist at NRCS.

**When:** Tuesday, August 28th, 2018 from 4:00 PM to 7:00 PM

**Where:** Ward's Berry Farm, 614 S Main St., Sharon, MA 02067

**CLICK HERE TO REGISTER:** <https://www.surveymonkey.com/r/XF8JOYD>

[Click here to request special accommodations for this event.](#)



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*Vegetable Notes. Katie Campbell-Nelson, Genevieve Higgins, Lisa McKeag, Susan Scheufele, co-editors.*

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