UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 24, Number 12 July 11, 2013

In this issue:

Crop conditions

The summer's first sweet corn harvests are on farm stands accompanied by an abundance of summer cucurbits. Start gathering supplies for preserving zucchini relish and cucumber pickles. The heat wave has subsided and there were fewer rain events in the last week with a high of 2 inches of rain recorded by the National Weather Service in the south western region of MA and less rain elsewhere. High humidity has lead to the onset of fungal and bacterial disease symptoms. Many insect pests such as Colorodo Potato beetle, flea beetle, Mexican Bean Beetle and striped cucumber beetle are beginning a flush of summer emergence and populations can be damaging. Summer storms are bringing more sweet corn pests up the coast for their annual visit. Crop conditions getting you down? Shake your farming blues away by attending some of the upcoming summer meetings to share and commiserate with fellow growers. See the back back of VegNotes for upcoming events.

Pest alerts

Late blight was confirmed in Franklin County, MA on tomato July 11th, in Erie County, NY on tomato July 10th and on potato July 9th. Previous reports in (FL, WV, LA, TN, MD, KY, VA, NC, WI) have been confirmed as Phytophthora infestans strains US-23 and US-7. Track disease progress at USA BLIGHT. Tomato and potato growers should be spraying those crops with protectant, curative and locally systemic fungicides labeled for oomycetes to prevent disease establishment and spread. Severity values totals are lower this week than last in MA however, a 5-day spray interval is still recommended in most locations because conditions for LB are highly favorable (see table 1). Spray when you can expect 2-3 hours of drying time. If you suspect late blight, contact the Diagnostic lab 413 545 3208. LB identification is free this year.

Mexican Bean Beetle reports are on the rise. Interested in trying a biocontrol wasp (Pediobious foveolatus) that parasitizes the larvae? Contact Tom Dorsey of the New Jersey Insect Rearing Laboratory to place a Pediobious order: thomas.dorsey@ag.state.nj.us. (609-530-4192)

Imported Cabbageworm and **Diamondback Moth** caterpillars were found feeding on collards, cabbage and broccolli in fields this week. See Brassica Caterpillars article in this issue for identification and management options.

Squash vine borer flights began 2 weeks ago and numbers are going up. Weekly captures in MA traps were: 5

Table 1. GDD and BLITECAST output for Late Blight Management

DATE: 7/11/2013	GDD Base 50F	Accumulated LB Severity Values - 7 days	Accumulated Rainfall - 7 days (in)	Recommended Spray Interval (days)
Pittsfield	895.7	11	0.38	5
Ashfield	971.3	1	0.23	10-14
Deerfield	1167.6	8	0.11	5
Belchertown	1174.9	9	1.08	5
Bolton	1134.1	20	0.04	5
Dracut	1146.6	9	0.11	5
Boston	1170.7	5	0.05	7
East Bridgewater	1173.4	13	0.47	5
Sharon	1280.3	8	0.09	5
Seekonk	1214.1	5	0.01	7

in Deerfield, and 25 in Dover. Growers of giant pumpkins (C. maxima types), summer squash and zucchini should be check stems for signs of eggs or feeding, and target stems with preventative sprays at a threshold of 5 moths per trap. Monitor flights with SVB lures in Heliothis net traps or yellow/white bucket traps with vapor tape placed above or the canopy.

Colorado Potato Beetle (CPB) The second emergence of adults are hatching from underground pupae onto potato, tomato, eggplant and wild Solanaceous hosts to feed and lay eggs. Wait for the larvae to hatch before treating.

Potato Leaf Hopper nymphs and adults are prevalent in potato, eggplant, bean and raspberry. Nymphs are found under leaves and first instars are about the same size as aphids but skitter sideways when disturbed. Plants withstand hopperburn better when they have adequate water and nutrients but may still suffer from reductions in yield. Threshhold is 1 nymph/every 3 compund leaves in potato and 1.5 nymphs/leaf in eggplant.

Purple blotch of onion is widespread in the state aided by the high humidity. Use fungicides to prevent infection and keep plants healthy as bulbs enlarge. Separate symptomatic plants for summer markets from non-symptomatic ones at the time of harvest to minimize rot in storage onions.

Spotted Wing Drosophila During the past week, trap captures in Massachusetts have increased moderately from 2 females and 1 male the last week of June to 6 females and 1 male the first week of July. For most growers, this means that spray programs should begin if SWD was found on the farm last year and there is fruit ripe or ripening soon (blueberry, raspberry, cherry, currants/gooseberries).

Cucurbit downy mildew In the past week additional CDM outbreaks have been reported in Ontario and Bucks County, PA. To date the disease has also been found in Florida, Georgia, Texas, South Carolina, North Carolina, Alabama, Maryland, Delaware, New Jersey and Ohio. Crops affected so far include cucumber, butternut squash, acorn squash, yellow summer squash, cantaloupe, giant pumpkin, and watermelon. Cucumber is the most commonly reported crop affected. As of July 11 the CDM IPM-PIPE disease forecast predicts a high risk of CDM development along the east coast up to southern MA and minimal risk in the more northern parts of New England. Farms in high risk areas should use fungicides labeled specifically for downy mildew.

SWEET CORN REPORT

The first harvests have begun and second plantings are silking with ripening ears. Corn earworm (CEW) is moving into the region. The numbers range from 4-8 moths per week in central, northeast and western MA, suggesting that a 5 day spray schedule is needed on silking corn in these regions. Captures of 17-24 moths/week in the Southeast suggest that a 4 day spray schedule is needed in that area (See Table 2). Summer storms are bringing the CEW and fall armyworm moth populations up the coast and into Massachusetts and the pressure can change very rapidly.

European corn borer (ECB) captures are low, indicating that the second flight of this moth has not yet begun or may be staying at low levels. Continue to scout fields as tassels emerge, as this is the best time to clean up ECB that has been feeding in the emerging tassels – catch them as they move from feeding sites in the tassel, down to the ear zone. It is likely that fewer tassels are infested than last week, as we are near the end of the first generation activity.

One fall army worm (FAW)was captured in a trap in Norfolk County this week but 9 other sites caught no FAW moths. FAW tends to be most attracted to whorl stage corn. They will also feed in emerging tassels. Scout 50 or more plants, noting how many have 1 or more ECB or FAW. Combine scout counts for ECB and FAW to determine if threshold is reached. The spray threshold is 15% of tassels containing one caterpillar or more.

Scouting corn tassels

We encourage growers to have your own CEW trap on the farm, so that you can check frequently and be able to respond to new flight. As noted above and in Table 2, trap counts do vary, even within the same region. Place the trap in a block with fresh silk, which is most attractive to CEW. See https://extension.umass.edu/vegetable/publications/sweet-corn-ipm-guide for details on what to buy and how to set it up with lots of pictures to show what you are looking for! This guide also has details about European corn borer and Fall army worm.

Table 2. MA Corn Trap Counts 6/27/13 - 7/4/13				
Location	**Total ECB reported**	**CEW Nightly Average**	**CEW Weekly Total**	**Spray interval for CEW**
CT Valley				
South Deerfield	0	n/a	n/a	-
Sunderland	0	1.1	8	*4 days*
Hatfield	6	0.6	4	*5 days*
Hadley	0	0.6	4	*5 days*
Southwick	0	0.6	4	*5 days*
Central & Eastern MA				
Spencer	4	0.7	5	*5 days*
Dracut	0	0	0	*no spray*
Tyngsborough	0	0	0	*no spray*
Lancaster	0	0	0	*no spray*
Concord	0	0.6	4	*5 days*
Millis	3	n/a	n/a	-
Sharon	4	3.4	17	*4 days*
Northbridge	0	0	0	*no spray*
Seekonk	0	4	24	*4 days*
Rehoboth	5	n/a	n/a	-
Sandwich	4	n/a	n/a	-
East Falmouth	4	n/a	n/a	

The newer, selective products for CEW, FAW and ECB provide good control while being easier on natural enemies and bees that are present in the field and safer for applicators to handle. Tese provide good alternatives to the synthetic pyrethroids (e.g. Warrior) and carbamates (e.g. Lannate) that were the mainstay of CEW control for many years. Based on review of published trials, the following products have provided good control.

Radiant (spinetoram): consistently equivalent efficacy with Warrior in trials - highly effective.

Belt (flubendiamide): equivalent efficacy to Warrior in some trials, slightly less in others.

Coragen (chlorantraniliprole): slightly less effective on CEW than Warrior but easier on beneficials and people.

Voliam Xpress or **Besiege** (a mixture of Coragen + Warrior AI's, each at lower rates): highly effective, often better than Warrior.

Growers we have spoken with who have been trying these products have also reported effective control.

Given that there are many beneficial insects in corn that feed on aphids, small larvae and pollen, and that honeybees move into corn when pollen is released, having the option of using more selective products is welcome. In organic fields, spinosad (**Entrust**) has been observed to give good control of CEW.

Keep an eye out for Northern corn leaf blight (NCLB) and have samples properly identified by a diagnostic lab. See the June 7th, 2013 issue of VegNotes for an article on NCLB.

- R. Hazzard and L. McKeag, UMass Vegetable Extension

FOOD STORAGE SURVEY

The UMass Extension Vegetable Program is conducting research on farm produce storage practices and facilities in New England in collaboration with UMass Building Sciences. We are conducting a survey to achieve two goals. One goal is to determine what storage facilities and storage methods are currently prevalent, what problem trends exist and how these trends may be mitigated and improved. The second goal is to offer an energy audit of each respondent's storage and offer a report based on their responses to measure energy efficiency and cost of operation. The information will serve as a baseline that will allow us to develop technologies and techniques to ensure optimum crop storage conditions while achieving energy efficiency and low cost operation. The survey is available now by following the web link posted here: https://www.surveymonkey.com/s/UMass_Veg_Ext_Food_Storage_Survey. The survey should take about twenty minutes to complete. Any information you are able to provide is greatly appreciated. We look forward to working with you as our efforts and research continues. Thanks for your time in participating in this survey and best of luck in the coming months.

- Ben Weil and Luke Doody, UMass Building Energy

BRASSICA CATERPILLARS

Early cabbage and broccoli crops are beginning to form heads, which means caterpillar injury will have more impact on the marketability of the crop. In the early season, the numbers tend to be lower than late season, but keeping the first heads clean is key. The major caterpillars on Brassicas include four species that differ in size and feeding habits, as well as how susceptible they are to certain insecticides. Getting acquainted with the pests helps you to know what kind of damage to expect and what to look for.

Imported cabbageworm

Imported cabbageworm; cabbage butterfly (*Pieris rapae*) is a very familiar white butterfly which can be seen in the daytime fluttering around Brassica fields. Each forewing has a dark border and one or two round black spots. Eggs are laid singly on the underside of leaves, about 1/8 inch in length, light green and slightly elongated, standing upright. The larva is gray-green, slightly fuzzy, and sluggish but can be very well camouflaged. Feeding and resting occur on the underside of leaves, and larvae feed more heavily in the head of cabbage or broccoli as they develop. The overwintering stage is the crysalis (pupa), which is green or brown, smooth with three pointed ridges on its back. There are 3-4 generations per year.

Diamondback moth caterpillar

Diamondback moth (*Plutella xylostella*) caterpillars are smaller, light green, appear more segmented with a forked end and more pointed in shape. When disturbed they wiggle vigorously and may drop off the plant on a string of silk. Feeding causes small, round holes and tends to be spread across the foliage and not necessarily concentrated in the head. The adult moths are tiny (<1/2 inch), light brown, and rest with their wings folded together like a tent. They overwinter in crop residue, but may also enter the region by migrating from southern states.

Cabbage looper

Cabbage looper (*Trichoplusia ni*) usually does not survive the winter in New England and arrives in migratory flights from farther south. Generally populations of cabbage loopers are not high until late July or August, though some years they are not found at all or earlier flights occur. Adult moths are mottled gray-brown, about 3/4 inch long, with a distinct round silver-white mark on each fore-wing. Since they fly at night, they are rarely seen unless monitored with pheromone traps. The cabbage looper caterpillar is light green, with wavy white or light yellow lines down the back and sides. Full-grown larvae reach 1 ½ to 2 inches. Cabbage loopers of any size will raise the middle of their body in a characteristic "loop" shape, as an inch worm would. Eggs are round, light green or yellow, and are laid underneath the foliage. Feeding tends to create ragged, large holes in foliage, on both frame leaves and heads.

Cross-striped cabbageworm

Cross-striped cabbageworm (*Evergestis rimosalis*; *Lepidopeta*: *Pyralidae*) has not historically been found in New England but has gradually extended its range northward. We first listed it in the New England Vegetable Management Guide around 2005, because it had become common in Connecticut. In 2012 this worm was found in Hampshire, Worcester and Norfolk Counties in MA. Its damage is similar to that of other caterpillars but it can be even more damaging if populations are high. One of the major differences between this insect and the other brassica caterpillars is that the eggs are laid in a group, and caterpillars feed in a group on one plant so that it's covered with big holes like buckshot.

Cross-striped cabbageworm (CSC) is closely related to European corn borer, and the adults are similar in shape and coloring – straw-colored with a little purple and crossed by wavy lines. Since it flies at night, you will likely only notice the caterpillars and their damage. The clusters of 3 to 25 eggs are yellow, flattened, and attached to the lower leaf surfaces. The caterpillars are light bluish-grey on top and green underneath, with numerous black transverse bands across their backs and a yellow line down each side. Larvae grow to 3/4"-long in 2 to 3 weeks. There are 2-3 generations per year, but generally

it's only in late summer that numbers reach damaging levels. Larvae can produce small holes in leaves until only veins remain, feed in terminal buds and sprouts, or burrow into heads. Plants with larvae are often completely skeletonized. Adjacent plants may be left undamaged.

Field Scouting and Management. It is especially important to check cabbage or broccoli plantings as they begin forming heads. Greens such as collards and kale should be scouted earlier, since all leaves are marketed. Check at least 25 randomly-selected plants throughout the field looking for caterpillars or fresh feeding damage on the top or underside of leaves. Feeding damage can be found on the underside of leaves or in the center of the plant where heads are forming. Look for black or green frass and tiny feeding holes, clustered together. Often it is easier to spot the frass and feeding damage first, then find the caterpillar. Classify plants as infested (one or more caterpillar present) or non-infested, and calculate the percent of plants infested. In the Northeast, there is generally no need to treat young plants unless weather conditions delay plant development and at least 35% of them are infested with any of these pests. Treat heading crops between the start of heading and harvest if 20% or more of the plants are infested. The most critical time to scout and apply controls is just prior to head formation. For leafy crops like kale and collards where all leaves are marketed a 10-15% threshold should be used. If the threshold is reached, use selective insecticides to protect beneficials that keep aphids under control and eat insect eggs and small caterpillars!

Do not use less than 50 gal spray material/A; higher volumes provide better coverage. Better coverage of lower leaf surfaces can also be achieved by using drop nozzles. Use a spreader-sticker. Biological insecticides such as Xen Tari or Dipel containing the bacterium *Bacillus thuringiensis* (*Bt*) are good options for controling all three species of cabbageworm. Because *Bt* kills caterpillars but does not kill other insects, it allows natural enemies to survive and contribute to pest suppression. Newer materials and the *aizawai* strain of *Bacillus thuringiensis* will usually provide better control of resistant DBM than older products. There are a number of selective insecticides which are effective, including products approved for use in organic systems (see 2012-13 New England Vegetable Management Guide for details).

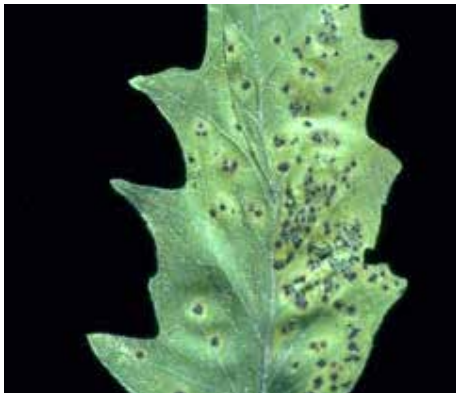
- updated by R. Hazzard and S. Scheufele, UMass Vegetable Extension

BACTERIAL DISEASES OF TOMATO

Three bacterial diseases commonly affect tomato crops: Bacterial Spot (*Xanthomonas campestris* pv. *vesicatora*), Bacterial Speck (*Pseudomonas syringae* pv *tomato)*, and Bacterial Canker (*Clavibacter michiganensis* pv *michiganensis*). Tomato pith necrosis is a less common bacterial disease that can be confused with bacterial canker. These diseases can affect foliage, fruit, and stems and distinguishing between them can be difficult. In general, bacteria are commonly introduced via overwintered weeds, crop debris, or by seed. Secondary spread is of bacterial cells is by rain splash and movement of workers or equipment through the field. Management of bacterial diseases is difficult once they are established, so using good sanitation such as buying clean seed, hot water treating seeds, maintaining good weed control, and rotating crops are essential to preventing disease onset.

Bacterial spot caused by *Xanthomonas campestris* pv. *vesicatora* (*Xcv*) is present wherever tomato and peppers are grown. In general, *Xanthomonas* pathovars have narrow host ranges. *Xcv* consists of different strains that vary in their pathogenicity to tomato, pepper, and solanaceous weeds. The bacterium is able to survive on tomato volunteers and can overwinter in diseased plant debris or on tomato stakes. Seed is an important mechanism for survival and dissemination of *Xcv*. Disease development is favored by temperatures between 80˚ and 90˚ F and by heavy rainfall. The bacterium is spread by wind-driven rain, workers, farm machinery, and aerosols. It penetrates through stomates and wounds created by insects, wind-driven sand, and tools. *Xcv* affects all aboveground plant parts. On leaves, the spots are generally brown, circular, and water-soaked. Bacterial spot lesions do not have concentric zones or a prominent halo. When conditions are optimal for disease development, spots can coalesce to form long, dark streaks. A general yellowing may appear on foliage with many lesions giving the plants a scorched appearance, and the plants may exhibit severe bending and twisting. Only green tomato fruit is susceptible to infection and lesions are quite distinct, beginning as minute, slightly raised blisters with a halo that resemble the birds-eye spot caused by *Clavibacter michiganense* (bacterial canker). As lesions enlarge, they lose their halo and become brown, raised, and scab-like on ripe fruit. Lesions on ripe pepper fruit may be scab-like or sunken.

Bacterial speck (*Pseudomonas syringae* pv. *tomato*) occurs on tomato but not pepper. It is a disease generally of minor



Bacterial Spot

Bacterial Speck

Bacterial Canker

Tomato pith necrosis

concern, favored by low temperatures and high moisture. The bacterium causes a fruit spot and foliage blight. This bacterium is also seedborne, spreads within fields in the same manner as bacterial spot, and may persist in weed species. Lesions on leaves are round and dark brown to black with a halo that develops with time. Spots may coalesce, killing large areas of tissue. On fruit, small (1/16 inch), dark spots or specks develop with the tissue around them often more intensely green than unaffected areas.

Bacterial canker (*Clavibacter michiganensis* pv *michiganensis*) is one of the most destructive tomato diseases in Massachusetts. Initial symptoms are the result of primary, systemic infection and first affect the lower leaves causing leaf curling, wilting, yellowing, and shriveling. In advanced stages, the pathogen spreads throughout the plant and causes poor growth, wilt, and plant death. Foliage throughout the canopy wilts, yellows, turns brown, and collapses. Stems can split resulting in open breaks or cankers and stems break easily. Secondary infections occur from rain splash onto foliage, stems, and fruit. Spots occur on green fruit and are very characteristic: white to yellow spots, 3-4 mm with raised brown centers ("bird's eye spots").

Tomato Pith Necrosis is caused by *Pseudomonas corrugata* and other soil-borne species of *Pseudomonas*. While high tunnels and greenhouses provide ideal conditions for the growth of early season tomatoes, this environment and traditional greenhouses also provide ideal conditions for this emerging disease of greenhouse tomatoes. This disease generally occurs on early planted tomatoes when night temperatures are cool, the humidity is high, and the plants are growing vigorously because of excessive levels of nitrogen. The disease is also associated with prolonged periods of cloudy, cool weather. Initial symptoms often appear just as the first fruit clusters reach the mature green stage and consist of yellowing and wilting of young leaves. Serious infections can result in yellowing and wilting of upper portions of plants with brown to black lesions on infected stems and petioles. When stems are cut longitudinally, the center of the stem (pith) may be extensively discolored, hollow, and/or degraded. Stems may be swollen, numerous adventitious roots can form, and infected stems may shrink, crack, or collapse. The epidemiology of this disease is not well understood; it is possible that the bacteria are seed-borne and most certainly survive in the soil in association with infected tomato debris.

Preventive measures to minimize the occurrence of pith necrosis in high tunnels include: adequate ventilation to avoid high humidity levels (especially during cloudy weather), avoiding excessive nitrogen levels to prevent vigorous plant growth, incorporation of crop debris to speed decomposition of residue and associated bacteria, and crop rotation. There is no effective treatment for this disease. Affected plants may recover if environmental conditions improve (warm, sunny weather) but if not, affected plants should be removed from the field to prevent spread of the disease.

Preventing losses to bacterial diseases:

1. Start with certified, disease-free seed or treat seed with hot water, hydrochloric acid, calcium hypochlorite, or other recommended materials.

2. Control bacterial populations that may be present on the leaf surface of transplants in the greenhouse. Young transplants may not display symptoms of bacterial diseases. Inspect and remove suspect transplants. Lower the water pressure in irrigation equipment to avoid damaging leaves. Avoid the practice of mowing

transplants to regulate transplant height or suckering plants when symptoms are present.

3. Plant into a clean field using sterilized stakes. Promptly incorporate crop debris after harvest. Rotate to a non-host crop before returning to tomato and do not allow volunteer tomato or weed hosts to survive.
4. Avoid working in fields when bacterial diseases are present and the fields are wet.
5. In general, bacterial diseases of field crops are difficult to control with pesticides; copper products, mancozeb, and Streptomycin solutions (eg. Kocide DF, Dithane F-45, Agri-mycin 17) are most effective and are labeled for use in MA. Streptomycin is labeled only for use on transplants in greenhouses before setting them in the field. When a significant amount of disease is present, pesticides are usually not effective.

- by S. Scheufele and Rob Wick, UMass Vegetable Extension updated 2013

Scarab beetles

Japanese Beetles have been flying for the past week or two. Oriental Beetles and Asiatic Garden Beetles are also actively flying now and, though less damaging, may appear in vegetable fields as well. All species are feeding and starting to lay eggs. There are four species of scarab beetles that are common in New England turf, fruit and vegetable crops, though none are native to the US. Japanese beetles are the most common and widely distributed but Oriental and Asiatic Garden beetles are expanding their range and activity.

Japanese Beetle

Japanese Beetle adults are about half an inch long, with a metallic green head. The wings are shiny copper or bronze color, and there are a few tufts of white "fur" along the side of each wing when it is folded back over the body. The adults are active in daylight and feed on many different kinds of trees, fruit and flower crops. Fruit and ornamental plants are preferred, but beetles can congregate in vegetables also. In vegetables, adults can cause silk clipping in corn, and leaf damage in sweet basil, collards, other greens, green beans, eggplant, asparagus, rhubarb, and peppers. Though numbers may be high, there is no need to treat unless actual feeding damage is significant. In corn, if there are more than two Japanese beetles per ear and corn is less than 50% pollinated, a pesticide application may be warranted to reduce clipping and ensure adequate pollination.

Asiatic Garden Beetle

Asiatic Garden Beetles are about half as long as a Japanese beetle adult, and somewhat more "plump" or domed in appearance. They are reddish-brown or copper-colored. They often are found near roots of plants when one is weeding. Adults feed at night, so one may find damage without seeing the beetles. During the day they hide in the loose soil or mulch around the base of the plants. Scout with a flashlight at dusk or during the night, or sift through soil to find them. Larvae feed on beet, carrot, corn, lettuce, onion, Swiss chard, and strawberry. Adults feed on carrot, beet, parsnip, pepper, cabbage and turnip.

Oriental Beetle

Oriental Beetles fly at night, but are very active during the day as well. The beetles are smaller than Japanese beetles, and usually are a rather mottled gray with black splotches. The pattern and color varies. The antennae are branched and are quite striking if you take a close look. Oriental beetles have a long flight period – through early August – and are very mobile. Adults tend not to feed heavily in vegetable crop foliage but show up in many crops. Grub damage may be worse in drought years and in weedy fields, but is not commonly a problem in vegetable fields and crops, though this is not well studied.

European Chafers a fourth species which may also be found, are slightly larger than Japanese beetles and are a fairly dull brown or tan in color. They are night fliers but can be seen in large numbers just at sunset, when they congregate in

favorite trees (such as locust or willow). Adults are not foliage feeders and grubs are mostly a turf problem.

Life Cycle

The life cycle of the Japanese beetle fits most of the species of grubs we encounter in New England, with minor variations. They have a one-year life cycle, with adults emerging from the soil in early July in most of Massachusetts (later farther north) to feed and mate. The females burrow into the soil (often in or near wide expanses of grass or sod) to lay eggs which hatch into tiny grubs (cream-colored larvae, C-shaped, with brown heads) that feed on roots of grasses and other plants (especially corn). Grubs molt twice by the middle of September, and continue feeding until the soils begin to cool down. In late fall the grubs migrate downward through the soil profile, staying below the frost line throughout the winter. In the spring as the soils warm up, the grubs move back into the root zone and resume feeding for about six weeks. By the middle of June, most grubs have completed their feeding requirements and pupate (still in the soil) for about a week before emerging as new young adults.

Management

On turf, insecticide controls normally target young grubs just as they begin to emerge from eggs. In vegetables, managing the grub stage may not be feasible (or necessary) since the grubs are most likely feeding elsewhere. Vegetable growers could run into problems with grub damage if turf or sod is plowed under in fall or spring and followed by a spring vegetable crop. A fallow or very weedy field may generate a hefty population of Oriental or Asiatic Garden beetles the following year.

Insecticides may be needed to control adult beetles if numbers are high and damage is significant. The 2012-13New England Vegetable Management Guide lists products for Japanese and/or Oriental Beetles in basil and sweet corn. For controls in a crop where these beetles are rarely a pest and therefore not mentioned in the Guide, check the label of commonly used broad spectrum synthetic pyrethroids, carbamates, and neonicotinoids (as foliar spray). Organic options include neem products and pyrethrin.

-R. Hazzard, adapted from Turf Management Update, Pat Vittum, Turf Entomologist, UMass, Beth Bishop, Michigan State University, Michael Seagraves, Cornell Cooperative Extension, and Ann Hazelrig, University of Vermont.

UPCOMING EVENTS

- **MA Farm Wineries & Growers Association Twilight Meeting**
  When: July 18, 2013 4:30 - 8:00 PM
  Where: Cold Spring Orchard, 391 Sabin Street, Belchertown, MA 01007
  The Massachusetts Farm Wineries & Growers Association and UMASS Extension are proud to co-sponsor an evening with George Hamilton, University of New Hampshire Extension Field Specialist. Please join us as Mr. Hamilton presents an informative and interactive workshop. A light dinner will be served during the registration period. The evening will feature an informative and interactive workshop on how to calibrate backpack and air-blast sprayers for vineyard operations. We will review basic calculations for back pack and air blast sprayers to help you to determine how much product to use on small and larger plantings based on label directions. Pesticide contact hours will be available for meeting attendees through UMASS Extention.
- **Food Safety Modernization Act (FSMA) Session**
  When: July 18, 2013 6:30 pm - 8:30 pm
  Where: Polish American Citizens Club, 46 South Main Street, South Deerfield, MA 01373
  Several farmer groups have raised concerns about the newly proposed FSMA rules and their cost to local growers. Rather than wading through hundreds of pages of rules, come to this session to learn how the proposed rules would impact your farm, and hear from those working to impact the rule-making process this summer. Roger Noonan, New England Farmers Union president and farmer, will discuss what these rules mean for local growers and will explain how to give feedback to the FDA through upcoming public hearings and written comments. MA Farm Bureau president Rich Bonanno and farmer Nathan L'Etoile will also be on hand to share their understanding of the proposed rules and how to affect them. Pizza dinner will be provided. Please RSVP by Monday, July 15th to Kristen at 413-665-7100, ext. 12 or kristen@buylocalfood.org.

- **MNLA/MFGA Summer Conference and Trade Show**
  When: July 25, 2013 - 8:30am to 3:00pm
  Where: Tower Hill Botanic Garden, 11 French Dr, Boylston, MA 01505
  The day offers horticultural eduation workshops throughout the day by well known reserachers and UMass Extension educators, as well as a trade show. Event Website: http://www.mnla.com/ Contact's name: Rena Sumner Contact's phone: 413-369-4731 Contact's email: mnlaoffice@aol.com

- **Cape Cod Fruit & Vegetable Twilight Meeting**
  When: Monday, July 29, 2013 5:00 - 7:00pm
  Where: Coonamessett Farm, 227 Hatchville Rd. East Falmouth, MA 02536
  All growers of vegetables & fruits, join Larry Dapsis, Extension Entomologist and Russell Norton, Extension Horticulture Educator, at Coonamessett Farm for an educational twilight meeting focusing on insect and disease management of fruits and vegetables. The twilight meeting will cover the latest information on monitoring, management, and lifecycle of the Spotted Wing Drosophila, a new pest of small fruit. Identification and management of tomato diseases will be covered with some new tools for local growers. Other topics include an update on the surveillance of Brown Marmorated Stink Bug and discussion of other pests that maybe prevalent this season. Held rain or shine! Cost: Free, but pre-registration is encouraged. 2.0 Pesticide recertification contact hours categories (27), (25) & (31). Event Website: http://www.capecodextension.org/horticulture-entomology-ticks/ Contact's name: Chris St. Pierre Contact's phone: 508-375-6638 Contact's email: cstpierre@barnstablecounty.org

- **Field Walks: Integrated Pest Management**
  When: Wednesdays from 3pm-5pm
  Where:
  July 31st: The Bars Farm, 141 Old Mill River Rd, Deerfield, MA http://www.thebarsfarm.com/contact.html
  August 14th: Powisett Farm, 39 Powisset Street, Dover, MA http://www.thetrustees.org/places-to-visit/greater-boston/powisset-farm.html
  You are invited to join the UMass Vegetable Team for Field Walks and learn to identify and discuss control strategies with Extension Educators and other growers while we scout the fields together. Bring a hand lens and clip board if you have one.

- **Vegetable Twilight Meeting: Organic IPM and Growing for a Winter CSA**
  When: Wednesday, September 18, 3-6 pm
  Where: Tangerini Farm, 139 Spring Street, Millis, MA 02054
  Tangerini's Spring Street Farm is a 67 acre working family farm growing and selling a variety of fresh fruits and vegetables, cut flowers, perennials and annuals. Tangerini's Farm sells its produce through the spring, main season and winter CSA as well as their on-site farm stand and farmers markets (main season and winter). They have been testing and using IPM on summer, fall and winter crops, following organic practices on most of the crops they grow and advanced IPM for sweet corn. Their expanding winter production and sales depends on their new storage bays, season extension using low and high tunnels and row covers, a vibrant approach to marketing. Come and see this winter's planting schedules, varieties, storage and tunnels.

Vegetable Notes. Ruth Hazzard, Katie Campbell Nelson, Lisa McKeag, Susan Scheufele, co-editors. Vegetable Notes is published weekly from May to September and at intervals during the off-season, and includes contributions from the faculty and staff of the UMass Extension Vegetable Program, other universities and USDA agencies, growers, and private IPM consultants. Authors of articles are noted.