Subject: Massachusetts IPM Berry Blast 6/21/11
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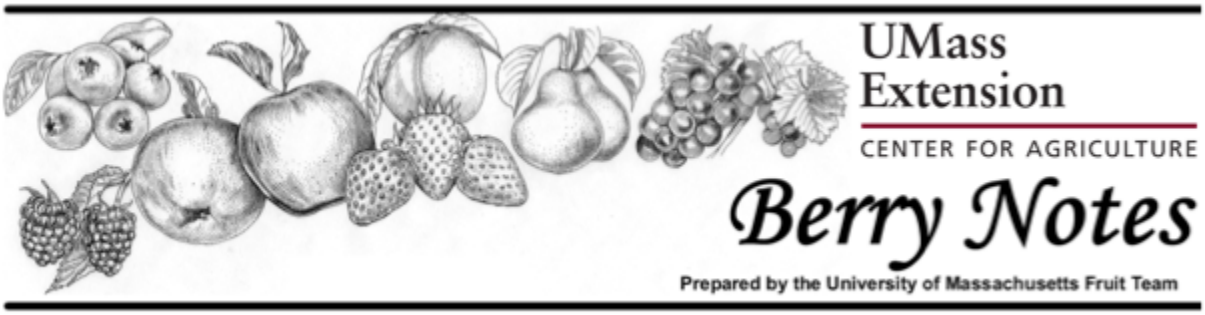

Massachusetts IPM Berry Blast 6/21/11

IN THIS BLAST:

STRAWBERRY

Strawberry Sap Beetle:(see http://www.nysipm.cornell.edu/factsheets/berries/ssb.pdf for IPM fact sheet on strawberry sap beetle)

ID/Life Cycle: Adults are small oval beetles, dark brown in color. They are often hard to see because they drop to the ground when disturbed, but they may be found in the cavities they have chewed out. They are found almost exclusively when there is ripe fruit in the field.

Damage: Sap beetles cause hollowed out cavities on ripe fruit, an injury very similar to slug injury.

Management
Monitoring: Strawberry sap beetle can be monitored by direct observation of ripening fruit to see if feeding has occurred. Bait traps with ripe fruit or bread dough can also be used to attract sap beetle to determine if a significant population is present.

Control strategies
Cultural/Biological:

- Rotate strawberry fields to alternative cash or cover crops for at least 3 years before replanting to strawberries to disrupt pest buildup.
- Ensure timely and complete picking of ripe fruit and the removal of over-ripe and damaged berries from the field.
- Place trap buckets of over-ripe fruit or bread dough outside field borders to intercept

migrating beetles and reduce pest numbers in the crop.

- Preserve natural enemies whenever possible by selecting spray materials that are less toxic to beneficials.
- Avoid planting strawberries near alternate hosts such as raspberry, sweet corn, and melons to reduce overwintering populations.

Chemical:

- Apply recommended insecticides ONLY if infestation is severe due to harvest restrictions.

Conventional (PHI)	Organic (PHI)
Assail 70WP, (1) *Brigade WSB, (0) *Danitol EC, (2) *Dibrom 8E, (1) Malathion 57EC, (3)	AzaGuard, (0) Azahar, (0) AzaMax, (0) Pyganic, (0)

Read labels thoroughly for application rates and restrictions (REI, PHI, etc.)
**** Restricted use material***

Black Vine Weevil -

ID/Life Cycle: There are several root-feeding weevils that are damaging to strawberries; black vine weevil, strawberry root weevil, and the rough strawberry root weevil are the best known. Additionally, green leaf weevils, have also been found feeding on strawberries in Massachusetts and Connecticut.

Black vine weevil adults are black weevils with short, broad snouts. Adults cannot fly because their wing covers are fused together and so they disperse chiefly by walking. The weevils feed at night and hide under leaf litter or in the soil during the day. The grubs are small, whitish and crescent shaped. They have no legs. There is one generation every year.

The black vine weevil overwinters in the soil as a partly grown larva, or "pre-pupa". Larvae resume feeding on roots in the early spring, causing the heaviest damage. Larvae pupate in late May and June for about 10 days. Adults begin emerging in June (600 GDD) and continue through July. Adults feed at night and hide around the base of the plant during the day. After two to three weeks of feeding, egg laying begins, usually in late July (approximately 1400 GDD). Larvae hatch in August (Approximately 1700 GDD) and begin feeding on roots. They continue to feed and grow until winter.

Damage: Larvae feed on roots and crowns, which can weaken the plants or lead to root rots. Adult weevils feed on leaves from May through August, causing notching of the leaf margins, which rarely leads to significant weakening of the plants. Under heavy infestation by root weevils, the plants decline, appear stunted and bear poorly. Infestations are generally in patches in the field.

Management

Monitoring: Degree-day models can predict emergence and development. This can help guide scouting and management activities. Symptoms of adult feeding can be seen on leaf margins beginning in June. The nocturnal adults can be spotted at night with a flashlight. Traps can also be made by placing fold of burlap around the base of the plant, or by creating a pitfall trap by burying a paper cup at soil level. Traps should be checked at least twice a week. It is important to determine when the first adults are emerging so that control measures can be taken before they begin to lay eggs (2-3 weeks after emergence). Emergence is usually toward the end of harvest making chemical

control difficult.

Control strategies

Cultural/Biological:

- Rotate strawberry fields to non-susceptible crops for at least 3 years before replanting to strawberries to reduce the buildup of root weevils.
- Plow down heavily infested fields should be plowed down as soon as possible after harvest to avoid migration of weevils to nearby fields.
- Avoid locating new strawberry plantings near old ones, especially if infested with root weevils.
- Create a deep trench between an old field and a new planting to capture black vine weevil adults as they migrate to the new field.
- Apply insect pathogenic nematodes in early May or late August if grubs are found in the soil.
- Be sure to keep the field irrigated during periods of active growth to avoid stress on the plants.

Chemical:

- Apply recommended insecticides after harvest to suppress adults before they lay eggs. (Controlling root weevil adults requires the highest allowed rate of labeled insecticides, and is best applied at night when adults are active.)

Conventional (PHI)	Organic (PHI)
Actara, (3) *Brigade WSB, (0) Platinum, (50)	Steinernema spp., 3 billion/A (0) Heterorhabditis spp., 1/2 - 1 billion/A (0)

Read labels thoroughly for application rates and restrictions (REI, PHI, etc.)

*** Restricted use material***

RASPBERRY

Raspberry Cane Borers

ID/Life Cycle: Raspberries are attacked by two types of cane borers. The *raspberry cane borer* is a slender black beetle with an orange band just below the head and has long antennae. The *red necked cane borer* is a smaller, slender, black beetle with a “coppery” neck. Unlike the raspberry cane borer, it has short antennae. The larvae are white and legless, with a flattened head (the family is often called flatheaded borers).

Raspberry cane borer has a two-year life cycle. Adults emerge in June and females lay eggs in the pith of new raspberry growth, about six inches from the tip of the cane. The female beetle then makes two rows of punctures around the cane, one just above and one just below the egg-laying point. This causes the tip of the new cane to wilt. The egg hatches in early July and the larva burrows slowly down the cane, passing the first winter within an inch or two of the girdle. During the second year the larva burrows down to the crown and passes the second winter at or below ground level. It completes its development the following spring and pupates in the soil.

Red-necked cane borers are active in June and July. Females lay eggs on the surface of canes. Larvae hatch and burrow directly into the plant. Young larvae tunnel around in a close spiral, girdling canes and producing gall-like swellings. Larvae overwinter in the cane, pupating there in early spring.

Adults leave the pupal skin and remains in the tunnel for about 10 days before emerging from canes repeating the cycle. There is one generation annually

Damage: *Raspberry Cane Borer*- Damage results from the girdling of cane tips and burrowing into crowns. Heavy infestations can reduce yield and ultimately destroy sections of a planting.

Red Necked Cane Borer-Damage results from weakened canes that easily break and have reduced yield. Heavy infestations can lead to areas of dieback in rows.

Management
Monitoring: Scout fields for flagging cane tips in early to mid-summer and for galls near the base during dormant pruning.

Control strategies
Cultural/Biological:

- Eliminate any wild brambles near the field that may be harboring these pests.
- Remove and destroy wilted tips infested with raspberry cane borer as soon as they appear.
- Remove and destroy any canes with galls during dormant pruning.

Chemical:

- Apply recommended insecticides to control adults before egg laying occurs at late prebloom.

DO NOT APPLY INSECTICIDES DURING BLOOM.

Conventional (PHI)	Organic (PHI)
Admire Pro, (7)	

Read labels thoroughly for application rates and restrictions (REI, PHI, etc.)
** Restricted use material*

Potato Leafhopper

ID/Life Cycle: Leafhoppers are small, green, bullet-shaped insects which take flight quickly if disturbed. The nymphs are lighter colored and do not fly. They are easily identified by their habit of moving sideways when disturbed.

Potato leafhoppers don't overwinter in Massachusetts but are blown up every year from the south on storm fronts. There are multiple generations every year.

Damage: Leafhoppers feed primarily on the underside of strawberry leaves, causing them to yellow between the veins and become curled and distorted. These symptoms are often mistaken for herbicide injury. Feeding activity is most serious during the late spring and early summer. They reduce vigor and runner production.

Management
Monitoring: Scouting is especially important in new strawberry plantings. Scout by brushing the leaves with the hand and looking for small adult leafhoppers flying off. Examine the underside of injured leaves to see if nymphs are present. There are no thresholds established for potato leafhoppers. Consider control if there are one or two nymphs per leaf and leaf curl is evident.

Control strategies
Cultural/Biological:

- None known

Chemical:

- Apply recommended insecticides when large populations of nymphs are noted on the leaves or symptoms become apparent.

If repeat applications are needed, rotate insecticides from different IRAC groups to reduce the chance of resistance development in the pest.

Conventional (PHI)	Organic (PHI)
Actara 25WDG, (3) Admire Pro, (7) Assail 70WP, (1) Malathion 57EC, (1) Provado 1.6F, (3) Sevin XLR Plus, (7)	AzaGuard, (0) Azahar, (0) AzaMax, (0) PyGanic 1.4 ECII (0) PyGanic 5.0 EC, (0)

Read labels thoroughly for application rates and restrictions (REI, PHI, etc.)
** Restricted use material*

BLUEBERRY

Aphids (for more IPM information see: http://ipmnews.msu.edu/fruit/Fruit/tabid/123/articleType/ArticleView/articleId/2816/Blueberry-aphid-management.aspx)
ID/Life Cycle: There are several species of aphids that infest strawberries, bushberries and caneberries. Adults are small, soft-bodied insects. Winged or wingless, they may be green yellow, pink, white, bronze, dark-brown or black. These insects tend to congregate on the underside of leaves, where their feeding causes the leaves to curl downward and be deformed..

Aphids overwinter as tiny eggs on blueberry bushes. In spring, young aphids hatch and colonize new leaf growth, living on the undersides of leaves. Populations grow during the summer and can cause sooty mold on fruit if populations are very high. There are multiple generations each year.

Damage: Aphids feed on leaves and succulent new growth. Damage occurs primarily when aphids transmit viruses from infected to non-infected plants. Very little direct damage from feeding occurs.

Management:
Monitoring: To scout for aphids, examine 2 young shoots near the crown on each of 10 bushes in a fi eld and record the number of shoots where aphids are found. Multiply by 5 to get the percentage of infested shoots. It is also a good idea to record the number of shoots with parasitized aphids to get a measurement of the level of biocontrol present in your field. Be sure to sample weekly from as wide an area in the field as possible to have a better chance of detecting whether aphids are present. Mapping 'hot spots' can provide a useful record over time and help direct future scouting and management activities.

Control strategies
Cultural/Biological:

- Preserve natural enemies whenever possible by selecting spray materials that are less toxic to beneficials.
- Rogue out all plants that exhibit virus symptoms.

Chemical:

- Apply recommended insecticides when aphids are first noted in a planting to avoid transmission of viruses such as blueberry scorch.
- If repeat applications are needed, rotate insecticides from different IRAC groups to reduce the

chance of resistance development in the pest.

- DO NOT APPLY INSECTICIDES DURING BLOOM.

Conventional (PHI)	Organic (PHI)
Actara, (3) Assail 70WP, (1) Provado 1.6F, (0)	AzaDirect, (0) M-Pede, (0)

Read labels thoroughly for application rates and restrictions (REI, PHI, etc.)
**** Restricted use material***

Where brand names for chemicals are used, it is for the reader's information. No endorsement is implied, nor is discrimination intended against products with similar ingredients. Please consult pesticide product labels for rates, application instructions and safety precautions. Users of these products assume all associated risks.

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