



Massachusetts IPM Berry Blast

May 14, 2014

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Strawberry:

Strawberry Bud Weevil (Clipper)

Tarnished Plant Bug

Two-spotted Spider Mite

Blueberry:

Mummy Berry

STRAWBERRY

Strawberry Bud Weevil (aka Clipper)



In the pre-bloom to early bloom period the clipper is one of the main insect pests in strawberries. The females lay an egg in an unopened flower bud and then clip the stem of the bud causing it to flop over or fall off. Only unopened flower buds are affected. Some strawberry varieties (e.g., Jewel and Seneca), can tolerate a fair amount of bud loss from clipper, causing the remaining fruit to size up more (like thinning peaches). However in high numbers, it can be a problem in any variety. Clipper tends to be a more severe problem along borders of plantings, near woods, hedgerows or stonewalls.



Scout for clipper by counting the number of damaged flower trusses per meter (yd) of row in several locations in the field. Treat for clipper when you find an average of more than 3 highly damaged flower trusses per meter of row. If the threshold is exceeded, consider treating with one of the labeled materials below. You may be able to treat only border rows near woods, hedgerows or stonewalls. **DO NOT SPRAY INSECTICIDES DURING BLOOM.**

(Photos from Ontario Crop IPM websites)

Summary Management Table:

Conventional (PHI)	Organic OMRI listed (PHI)	Cultural Practices
*Bifenture 10DF (0) *Brigade WSB (0) *Danitol 2.4EC (2) *Lorsban 4E (21) Molt-X (0)	Aza-Direct (0) AzaGuard (0) BioLink (0) PyGanic EC (0)	<ul style="list-style-type: none"> • Avoid planting near other hosts (e.g., brambles) • Control wild hosts nearby (e.g., wild strawberries or wild brambles) • Monitor field edges near woods, stone walls or hedgerows first since this is where clipper overwinter • Rotate field out of strawberries for 3 years if heavily infested • Renovate carry over fields promptly after harvest is complete

*= Restricted Use Material -- Read labels thoroughly for application rates and restrictions (REI, PHI, etc.)

Tarnished Plant Bug (For IPM info see <http://www.omafra.gov.on.ca/IPM/english/strawberries/insects/tarnished-plant-bug.html>)



This pest causes “cat faced” or “button berries” in strawberries and misshapen fruit in raspberries. Tarnished plant bug adults and nymphs cause damage to the fruit but nymphs are more abundant so are of greater concern. Nymphs are yellow/tan to light green, have long antennae, look a bit like aphids but unlike aphids they move very fast when disturbed.



Scouting for nymphs in strawberry by striking the plant over a white colored dish or piece of paper as this will knock the nymphs free from plants. Immature TPB (nymphs) are sampled by shaking flower trusses over a flat white surface. Thirty flower clusters should be sampled evenly from across the field (typically 6 clusters at 5 locations or 5 clusters at 6 locations). If 4 or more flower clusters are infested with nymphs (regardless of how many) a spray is recommended. A follow-up spray application may be made after bloom if TPB are still present in high numbers (check harvest interval before selecting material). If the threshold is exceeded, consider treating with one of the labeled materials below. **DO NOT SPRAY INSECTICIDES DURING BLOOM.** (Photos from NY IPM and Ontario Crop IPM websites)

Summary Management Table:

Conventional (PHI)	Organic OMRI listed (PHI)	Cultural Practices
Assail 30SG (1) *Dibrom 8EC (1) *Danitol 2.4 EC(2) *Bifenture 10DF (0) *Brigade WSB (0)	Mycotrol O (0) PyGanic EC (0) Aza-Direct (0) BioLink (0)	<ul style="list-style-type: none"> • Row covers accelerate development and help avoid injury. • Tarnished plant bug pressure is often highest in weedy fields or in fields bordered by woody shrubs.

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Two-Spotted Spider Mite (for IPM info see <http://www.omafra.gov.on.ca/IPM/english/strawberries/insects/two-spotted-spider-mite.html>)



Two-spotted spider mite can be a problem in plantings starting early and throughout the growing season. This is a tiny arthropod that lives on the underside of leaves and damages the plant by sucking out chlorophyll from the leaves. When allowed to grow to large numbers, tssm feeding weakens the plants and makes them more susceptible to stress and infection by other pathogens. You may see areas of the field with whitish or yellowish stippling on leaves.

Scout for TSSM by monitoring weekly by sampling the field in 5 to 10 locations. Five to ten leaves should be sampled at each location for a total of 60 leaves. Examine the underside of the leaves for the presence or absence of TSSM. Record the information on a field map so that “hot spots” can be identified and treated. A miticide application is recommended if 25% (i.e., 15 leaves) or more of a 60 leaf sample is infested with TSSM.



Natural predators exist which feed on two-spotted spider mites. One such predator, also a mite (Neoseiulus fallacis), is native to the northeast and often maintains TSSM populations at non-damaging levels. Another is Phytoseiulus persimilis. Both are commercially available for release to control TSSM. Beneficial mites must be introduced before large populations of mites develop, but after insecticides for tarnished plant bug have been applied.

If the threshold is exceeded, consider releasing predators or treating with one of the labeled materials below. **DO NOT SPRAY MITICIDES DURING BLOOM**

BELOW. DO NOT USE NAT MITTICIDES DURING BLOOM.
 (Photos from NY IPM and Ontario Crop IPM websites)

Summary Management Table:

Conventional (PHI)	Organic OMRI listed (PHI)	Cultural Practices
Acramite 50WS (1) *Agri-Mek EC (3) Savey 50DF (3) Zeal (1) Vendex 50WP (1) Kanemite 15SC (1) Oberon 2SC (3) Portal (1) *Bifenture 10DF (0) *Brigade WSB (0) *Danitol 2.4EC (2)	JMS Stylet Oil (0) Trilogy (Neem) 1-2% solution (0) Aza-Direct (0) Microthiol Disperss (0)** Predatory mite release, rate varies (0)	<ul style="list-style-type: none"> • Avoid planting near wild hosts that might harbor insect pests • Avoid allowing field to become weedy which seems to lead to higher populations of this insect pest • Do not overfertilize with Nitrogen as this stimulates higher mite populations. • ** Don't apply Sulfur to sensitive varieties or within 2 weeks of oil applications or if temperatures will exceed 90°F.

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BLUEBERRY

Mummy Berry ID & Management

ID/Disease Cycle: The first symptom of this disease is browning along the major leaf veins on newly emerging leaf clusters. The leaves will quickly and bend to resemble a shepherd's crook. A light gray powdery layer of spores develops at the leaf base. These spores go on to infect flowers and fruit. Infected green berries appear healthy but cutting them open reveals a white fungal growth inside. When berries start to ripen, infected berries appear pinkish tan and slightly ridged. They feel rubbery and contain a gray to black fungal mass inside. Infected berries eventually become faded, shrivel up, and fall to the ground. After the fruit skin has weathered off, the berries look like tiny black pumpkins.

The fungus overwinters in the mummified fruit on the ground. In early spring, trumpet-shaped mushroom cups produced on the mummies eject windborne spore that infect young shoots. Frost may increase susceptibility of blueberry shoots to infection. Spores are produced on blighted shoots and are carried to flowers by wind, rain, and insects (bees), resulting in fruit infections. Mummies that fall to the ground provide inoculum for the disease in the following year.



photo credits: 1) MSU Blueberry Facts 2) eXtension fact sheet 3) NC State Fruit Consortium

Damage: The fungus infects and invades the developing fruit rendering it unmarketable.

Management:

Monitoring: Consult scouting records from previous years to determine if build-up of this disease is indicated. Monitor weather conditions to identify likely infection periods. Scout fields beginning at budbreak for symptomatic tissue. ***This timing often coincides with Fortsythia bloom.***

Control strategies:

Cultural/Biological:

- Plant resistant varieties whenever possible. Those that are most resistant to the shoot blighting phase of the disease include Bluejay, Darrow, Duke, Elliot, and Toro. Cultivars that are consistently resistant to the fruit infection phase include Northsky, Reka, Northblue, Bluegold, Bluejay, Weymouth, and Patriot. Resistance to fruit infection appears to be unrelated to resistance to shoot blight, and weather factors can also affect cultivar response to the disease.
- Prune bushes to open the canopy to light, air, and spray penetration.
- Cultivate beneath plants in fall and again in early spring to disrupt overwintering inoculum.
- Apply a 3-4" layer of mulch material over the soil surface in early spring before mushroom cups emerge to create a physical barrier to spore release.

Chemical:

- Apply recommended fungicides during the period between budbreak and tight cluster if scouting and weather monitoring indicate risk of infection.
- Time fungicide applications closely to frost/freeze events that predispose tissue to infection.
- Repeat fungicide applications at recommended intervals if weather conditions are conducive to infection.
- Rotate fungicide materials from different FRAC groups to avoid promoting the development of resistant strains of this disease.

Summary Management Table:

Conventional (PHI)	Organic OMRI listed (PHI)	Cultural Practices
Abound F (0) <i>CAUTION for spray near or with equipment also used in apples</i> Bravo Ultrex (42) Captec 4L (0) Indar 75 WSP (30) Orbit (30) Pristine (0) Proline 480 SC (7) <i>Must have copy of supplemental label</i> Quash (7) <i>Must have copy of supplemental label</i> Switch (0)	Actinovate AG (0) Oxidate (0) Serenade Max (0)	<ul style="list-style-type: none"> • Use resistant varieties • Prune for open canopy • Cultivate beneath plants after harvest to disrupt inoculum • Mulch in early spring to cover inoculum

**= Restricted Use Material -- Read labels thoroughly for application rates and restrictions (REI, PHI, etc.)*

Archived IPM Berry Blasts are available at the [UMass Extension Fruitadvisor](http://umass.edu/extension/fruitadvisor) website.

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