

Strawberry Insect Management, December 2009

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To me, **tarnished plant bug** is the most important arthropod pest of New England strawberries. It attacks flower buds, flowers, and young fruit, up to about 1/3 grown. TPB overwinters as an adult, and feeds on a huge range of plants --- over 500 species. The severity of attack in your strawberries relates strongly to location. If there is a lot of early succession vegetation nearby (especially alfalfa or fallow fields with weeds), you can expect very heavy pressure. If your bed is surrounded by woods, you can get very little TPB pressure.

Nymphs do most of the injury. For June-bearing varieties, the overwintered adults and their nymphs are the primary concern. If you have alfalfa nearby, avoid mowing it when strawberries are in bloom, or have green fruit present. That drives them into your strawberries, just when they are vulnerable.

Scouting really pays off for this pest, since pressure varies so much. Details are in the New England Small Fruit Pest Management Guide. In recent years we have slightly shifted our emphasis on when you scout. We prefer to avoid spraying during bloom (protect pollinators), so we've shifted our emphasis to starting scouting shortly before bloom, when there are flower buds present. For those who like simple scouting, use the old threshold: treat if four or more trusses (branches of flowers or flower buds) are infested, out of 30. For large acreage, a more complicated method is described in the guide. It really saves time.

I won't list pesticide choices here --- you should go to the guide for that. I often steer people away from Brigade; in NH I've seen serious two spotted spider mite problems triggered by Brigade spraying. It has been seen elsewhere, too.

Clipper could be called other things on pesticide labels: strawberry clipper, strawberry weevil, or strawberry bud weevil. No, strawberry root weevil is something else. Clipper overwinters as an adult, and has just one generation per year. "June bearing" varieties are regularly attacked, but in "ever-bearing" varieties, the fruit in late July and later are not hit. Clipper only attacks the flower buds, not opened flowers. The female lays an egg in the bud, then clips it off. Inside, the tiny grub feeds and grows, emerging in mid-summer.

Some varieties can compensate for some clipper injury, by making the remaining fruit larger. Jewell and Seneca compensate well, so clipper attack is less serious in those varieties. Moderately compensating varieties include Lateglow and Primetime. Some varieties show little or no compensation, including Earliglow, Cavendish, Northeaster, and Honeyoe.

The edges of fields are usually hardest hit, especially when beds are new. They move in about 30 feet (10 rows) each year, so older beds can have injury throughout. Scouting pays off for this pest, too. Details are in the guide. You sample at least 5 sites per field, when the unopened buds are present. Our threshold has changed a bit, to recognize the difference in severity, on buds of different types: *3 clipped primary buds/meter* or *30 clipped secondary or tertiary buds/meter* makes it worthwhile to spray. You might not need to treat the whole bed.

Black vine weevil and its two smaller relatives can be very serious pests. There are three species here that hit strawberry. The largest, most common, and most damaging is black vine weevil. Slightly smaller (almost identical) is rough strawberry weevil. I don't see many of

those. The smallest and least damaging is strawberry root weevil. They're common. The biology of these three is virtually identical, so we usually manage them as a group.

Adults hide from the light, so they're in soil or under leaf litter during the day, and come out to feed at night. In southern NH, adults appear about July 1st. One clue that they are present is that adults chew notches in the edges of the leaves. They begin laying eggs about August 1st, and continue into Fall if temperatures are mild. The eggs hatch into white, C-shaped grubs **with no legs**. They feed on the roots and crowns, and overwinter as larvae. In spring, the larvae are at their largest size, and feeding gets most intense.

Black vine weevil can survive a long time as an adult, even over one year, if it has some winter protection. Older adults lay more eggs than the younger ones, so if we give them good winter protection, populations can build even higher. To me, the potential for this problem is where winters are milder (southern New England?), and we try winter row covers.

Controlling black vine weevil can be very difficult. Chemicals (Brigade, Platinum) don't seem to work well here. You could try insect-attacking nematodes. They can sometimes be very effective, but many attempts are disappointing, in part due to several problems. 1) You must use the correct species of nematodes: *Steinernema feltiae*, *Heterorhabditis bacteriophora*, or *Heterorhabditis megidis*. 2) You must apply them at a very high rate: 3 Billion/acre for *Steinernema*, or 1 Billion/acre for *Heterorhabditis*. 3) Timing is critical: May 15th to 25th, **or** Aug 28-Sept 10. 4) Avoid applying them on a hot, sunny day. 5) Irrigate just before & immediately after applying, or many will die. 6) Check the viability of your shipment when it arrives. 7) To apply with a low pressure sprayer, remove the fine screens first. You'll have to use agitation, or they quickly settle. They are expensive; it pays to shop around.

Option 3: destroy the infested bed, and make sure no plants that can support BVW larvae grow there for the next 2 years. You have to keep out *Achilea*, *Adiantum*, *Asters*, *Astilbe*, *Azaleas*, *Begonia*, *Bergenia*, Blackberry, Calla lily, Christmas fern, *Cinquefoil*, *Cyclamen*, Dandelion, Dock, *Epimedium alpine*, *Epimedium grandiflora*, Hemlock, *Heuchera*, *Hosta*, *Hydrangea*, *Impatiens*, *Isoloma*, Lily of the valley, *Lythrum*, Mountain laurel, *Phlox*, Plantain, *Physostegia*, Primrose, Raspberry, *Rhododendron*, Rhubarb, *Sedum*, Strawberry, Sheep sorrel, Wood sorrel, *Taxus*. Move your new bed 100 yds away (farther is better).

You could completely surround your new bed with a barrier fence of plastic sheeting stapled to (outside of) wood stakes (10" above ground plus 2-3 inches of plastic buried). It prevents adults getting into a new field (they can't fly). Spraying the outside of the fence with horticultural oil helps make it difficult for them to climb. The same is true if the plastic is dusty. Problems: you've got to keep the barrier up July 1 through the fall until the mild weather stops. Also, you can't drive field equipment over them, or you'll breach the barrier.

Two-spotted spider mite (TSSM) can be serious in hot, dry years or where predators have been killed. When you scout, don't forget the undersides of the leaves. You'll need a hand lens or magnifying glass. Threshold: 15 or more infested leaves, out of 60. Be sure you check a number of spots across the field! The guide lists pesticide options.

White grubs: avoid planting strawberries where grass grew last year, and control grassy weeds. Admire Pro and Platinum are now labeled for controlling white grubs in strawberry. **Sap beetles:** no good choices to deal with them. Do your best to keep the field free of over-ripe fruit! That odor strongly attracts them. There are pesticides, but they have problems...