

with a long snout.

The female weevil chews a small hole in unopened flower buds and lays an egg in the hole. She then girdles the stem just below the bud. The flower bud dries up and dangles from the stem, eventually falling to the ground. The immature weevils, or grubs, develop in the girdled buds, emerging as adults in the early summer, and then migrating to wooded areas.

These insects are not always present and may only cause minimal damage some years. Examine the plants before bloom for clipped buds. If the field has had a history of clipper injury, the first appearance of clipper indicates the need to spray.

Management: Check for presence of clipper by examining new flower trusses as they first emerge from the crowns in April or May. The weevils will sometimes crawl in among the unopened buds for shelter. They are most likely to be in rows near woods or hedgerows. Later, look for shot-holes in opened flower petals and/or clipped buds of unopened flowers. In the past, the IPM action threshold for this insect is 1 clipped bud per 2 ft. of row or one live adult. Research done in recent years suggests that many more clipped buds can be tolerated without significant yield loss. A comparison of old and new sampling methods done by researchers at Cornell University (Hortscience 34 (1): 109-111, 1999) can be seen in Table 17 below. Sample at least 5 locations in the field. If you determine that the infestation is limited to the edge of a field, you may only need to spray the border rows. If you see evidence of clipper and determine a spray application is necessary, follow recommendations for materials and timing in the strawberry pest management schedule.

Sap beetles (*Stelidota geminata*): Sap beetles cause hollowed out cavities on ripe fruit, an injury very similar to slug injury. Adults are small oval beetles about 2mm long and 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.

Management: The best management for this pest is sanitation; keeping the field as free as possible of ripe fruit. Sap beetles may be trapped with bait baskets of over-ripe fruit placed between the edges of the field and wooded areas. Spacing

recommendations are not known. Place traps as soon as bait fruit is available. Brigade™ may be used for control if absolutely necessary; it can be sprayed within 12 hours of harvest, but might devastate mite predators. Read the label carefully. See pest management schedule for recommended materials and timing.

Thrips (*Thysanoptera*): Thrips are tiny insects that feed on flower parts. Several species occasionally infest the flowers of strawberries. The adults are slender, winged, about 1/25 inch long, and are orange or yellow. Young thrips are smaller, wingless, yellowish, and active. These insects breed on grasses and weeds in spring, and move to strawberries at bloom. They insert their eggs in plant tissue at the base of flowers, and in tender, new foliage.

Thrips begin feeding on the seeds and the inner surface of the hull soon after the buds open. As the fruit expands and the seeds separate the thrips feed extensively on the fruit between the seeds. Thrips feed by piercing the surface cells with their mouthparts and sucking the contents, causing cells to die. With continued feeding, the entire fruit becomes bronzed.

Management: Thrips can build up to damaging levels. Scouting for this insect can be difficult because of their small size. Fruit should be examined when they are very small, 5-10 mm in diameter. Examine under the calyx for presence of thrips, or place in a zip-lock bag in the sun. This will drive the thrips out so that they can be counted. Canadian researchers indicate that more than 25 thrips per 50 sampled fruit will result in unacceptable levels of fruit damage. See Table 18 below. Several insecticides labeled for use on strawberries are effective on thrips. Consult the labels.

Table18. Tentative guidelines for thrips in strawberries.

Characteristic	Definition
Sample Size	50 fruit/acre
Sample Time	Early fruit maturity stage (5-10 mm diameter)
Suggested Limits	25 thrips/50 fruit for PYO 5 thrips/50 fruit for shipping berries 2 thrips/berry = 20% damage

Source: Kevin Lynch, *New Brunswick Agriculture, 1995. Courtesy Pam Fisher, Ontario Ministry of Food and Agriculture*