

IPM Fact Sheet Series

**UMass Extension Fruit Team**

Fact Sheet #SI-008

**Strawberry - Tarnished Plant Bug (*Lygus lineolaris*)**

**ID/Life Cycle:** The Tarnished Plant Bug (TPB) adult stage is a small (1/4 in), angular, bronze colored insect with a triangular marking on its back. They are very mobile and quick to fly when disturbed. They are a 'true bug' with piercing/sucking mouthparts. The immature stage, or nymph, is smaller and bright green, resembling an aphid, but much more active and lacking the distinctive cornicles found on aphids. TPB nymphs go through 5 molts or instar stages starting very small and growing to just under the adult size of 1/4 inch and lack wings so are unable to fly. TPB is ubiquitous and a generalist feeder with a wide host range.

Tarnished plant bug overwinters in protected areas such as leaf litter, plant debris, hedge rows and brush piles. Adults become active and lay eggs in grasses, broadleaf weeds, and in strawberries in early to mid-May or when daytime temperatures are in the high 40°Fs. Egg laying begins when daytime temperatures are in the 60°Fs. Eggs hatch to nymphs in 7-10 days depending on the temperature. The nymphs may be present on the plants as early as the second week of May. The first observation of nymphs usually occurs during full-bloom period of mid-season flowering cultivars. Nymphs undergo 5 stages of development or instars and there are several (3-5) generations per year making it a season-long pest, especially for Day Neutral cultivars.



**Figure 1.** Left, TPB Nymph (3<sup>rd</sup> instar); Center, Yellow Rose Aphid; Right, TPB Adult on Strawberry Flower. (Photos: D. Handley, Univ of Maine Extension and S. Bauer, USDA ARS)



**Figure 2.** TPB damaged fruit. (Photo: D. Handley, Univ. of Maine Coop. Ext.)

**Damage:** This is the most significant insect pest in strawberries grown in the Northeastern US or Eastern Canadian Provinces. Both adults and nymphs feed on the developing flowers and fruit, sucking out plant juices with straw-like mouth-parts. This results in deformed fruit: typically "cat-faced" berries, also called nubbins or button berries. Such fruit are generally unmarketable. TPB remain active in the planting as long as the susceptible tissue of open blossoms and green fruit is present. Damage can cause significant crop loss.

TPB damage can sometimes be confused with damage caused by poor pollination or sub-lethal frost injury during bloom.

Research suggests that:

- 0.95 nymphs/cluster = 13% unmarketable fruit
- 0.55 nymphs/cluster = 3.6% unmarketable fruit
- 0.15 nymphs/cluster = 2% unmarketable fruit

## Management

**Monitoring:** Adult TPM can be monitored using white sticky traps just prior to bloom but



**Figure 3.** Tapping strawberry flower trusses into a tray to count TPB nymphs. (Photo: from [Ontario Crop IPM](#))

this is often insufficient because both adult and immature TPB can be present at the same time. No action thresholds are associated with sticky traps. However, the advantage to early monitoring with traps is that if high numbers of TPB adults are found on traps before bloom, an early insecticide spray may be applied before risk of pollinator injury is high.

Monitor for TPB nymphs by shaking 50-100 flower trusses over a white surface and counting the number of nymphs present beginning at 10% bloom and continuing weekly until bloom is complete. (Be sure to know the difference between TPB nymphs and aphids.) Do this in random locations throughout the field by walking a “V” or “W” pattern across it and stopping at 5 or 10 spots

(depending on the size of the field) at various intervals. At each sampling site shake 10 flower clusters over a white pan or paper to dislodge the nymphs.

The action threshold in June bearing varieties is 0.15 nymphs per blossom cluster or 1 nymph per 6 blossom clusters sampled. Alternatively, a threshold of 6.5 infested clusters/50 sampled (regardless of how many TPB/cluster), can be used to speed up the sampling. If this level is reached control measures can be applied to maintain berry quality and yield before too much damage occurs.

**Sequential Sampling:** a time-saver. To save time further, a sequential sampling plan may be used to determine how many clusters should be sampled. By using the table below, you can make a spray/no spray/keep looking decision by first examining a minimum of 15 clusters. If you find 0 TPB nymphs, you can stop and make a “no spray” decision. If you find more than 0 but less than 3, you should continue sampling. If you find 3 or more TPB nymphs, control is required in order to avoid economic damage to your crop. If the maximum of 50 flower clusters are sampled and no decision is indicated, the grower should sample again in 1 or 2 days. This method allows scouts to spend less time monitoring in fields where populations are very low, or very high. More time is spent sampling fields where TPB populations are close to the threshold.

**Table 1.** Monitoring for tarnished plant bug in strawberry.

Number of Clusters Examined	NUMBER OF FLOWER CLUSTERS INFESTED			
	Control Not Required	Keep Sampling	Control Required 2% low threshold	Control Required 4% high threshold
15	0	1 to 2; check 5 more	3 or more	5 or more
20	0	1 to 3; check 5 more	4 or more	5 or more
25	1 or less	2 to 3; check 5 more	4 or more	6 or more
30	2 or less	3; check 5 more	4 or more	7 or more
35	3 or less	4; check 5 more	5 or more	7 or more
40	3 or less	4; check 5 more	5 or more	8 or more
45	4 or less	5; check 5 more	6 or more	9 or more
50	5 or less		6 or more	9 or more

## Control Strategies:

### *Cultural:*

- Control weeds in and around the planting to reduce populations of this insect.
- Avoid mowing nearby fields during bloom or early fruit development.
- Avoid planting strawberries near alfalfa, which attracts high populations of TPB.

### *Biological:*

- Preserve natural enemies whenever possible by selecting spray materials that are less toxic to beneficials.
- Naturally occurring predators that feed on the nymphal stages of Lygus bugs include Bigeyed Bugs (*Geocoris* spp.), Damsel Bugs (*Nabis* Spp.), Minute Pirate Bugs (*Orius tristicolor*), and several species of spiders. However, they may not achieve adequate control in moderate to high infestations.
- Introduced species of parasitoids include *Peristenus digonutis* and may be found in high enough populations in some areas to reduce modest populations of TPB.

### *Chemical:*

- See [New England Small Fruit Management Guide](#) for currently recommended spray materials and rates for TPB.
- Apply recommended insecticides if threshold levels are exceeded.
- AVOID APPLYING INSECTICIDES DURING BLOOM.
- If a bloom period insecticide application is unavoidable, use the material with lowest risk to pollinators and spray in the evening when pollinator activity is low.
- If repeat applications are needed, rotate insecticides from different IRAC groups to reduce the chance of resistance development in the pest.

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