

Shedding Light on the Elusive Tarnished Plant Bug

By Cheryl Bruce, VOF Staff

The tarnished plant bug, *Lygus lineolaris* (TPB) is one of the most challenging pests for organic farmers and gardeners. This is because TPB has a wide ranging appetite and will feed on almost every crop on the farm. Once you learn to recognize the signs of damage, you'll quickly see how prevalent this pest is. Because there is not an easy solution for control, the pest can seem rather elusive. The extent of damage it causes can result in significant problems, especially when populations get out of control.

Hosts

Tarnished plant bug feeds on a variety of vegetable crops such as lettuce, spinach, cabbage, peppers, tomatoes, eggplant, broccoli, fennel, and basil. TPB enjoys fruit crops such as strawberries, apples, and brambles. Alfalfa and flowering weeds are also on the menu. Red root pigweed is a favored host of the pest.

Life Cycle

Adults which overwinter in weeds, hedgerows and alfalfa become active by late April. These newly active adults feed and lay eggs. Their offspring, the first generation nymphs, also begin to feed. It is the overwintered adults and first generation offspring that cause the most damage to fruit crops. The offspring reach adulthood in about 25-30 days and also lay eggs. These offspring, the second generation, cause the most damage to vegetable crops.

Adults are oval shaped, light green to brown in color and 1/4 inch long. Forewings exhibit a black tipped yellow triangle. Adults deposit eggs on stems, midribs, and blossoms of host plants. The eggs are curved, elongate and approximately 1mm long. In about 1 to 2 weeks the eggs hatch and the nymphs will feed on plant sap as they develop into adults. Their mouthparts enable



Tarnished Plant Bug
Photo by UVM Entomology Lab

them to pierce the plant tissue and then suck out the plant's sap. Nymphs are yellow-green in color and wingless. As they mature, four black spots appear on the nymph's thorax. Once fully developed, the adults will emerge and fly in great masses to new sites for a new cycle. There are at least three generations per year in the Northeast, with peak populations occurring in mid June and mid July.

Damage

On leaf stems and ribs, feeding results in localized discolored patches, scabs, and small spots. Severe injury can disrupt nutrient flow, cause wounds in plant tissue and allow entry of disease. A plant toxin released during the feeding process in lettuce causes brown lesions along the midrib, which reduces marketability. These lesions can also be seen in chard, cabbage, and celery. Feeding on leaf buds can result in small holes in young leaves, as with spinach and basil, and tip dieback upon leaf expansion, seen in celery and asparagus. Feeding on leaf stalks disrupts tissue at the base of the leaf, causing dieback of the whole leaf. This can be witnessed in both fennel and carrot crops. TPB feeds on the flowers and buds of eggplant, pepper, and tomato causing flower drop, which can greatly reduce yields. The feeding on fruit and flower buds such as strawberries results in deformed fruits and reduced yields.

Management

Crop rotation has virtually no effect on TPB populations because the pest is very mobile and feeds on such a variety of crops. However, managing the whole farm with respect to hosts will have a significant impact. Avoid mowing host plants in the area of other host crops that are in a susceptible stage. For example, do not mow a stand of alfalfa just prior to or during flowering of neighboring solanaceous crops. The mowing will drive the TPB into the field containing the tomatoes and eggplants and result in significant flower drop. Alternatively, a field of hairy vetch in the pre-bloom stage would act as a trap crop for TPB keeping them away from susceptible crops. It is critical to control weeds and keep headlands mowed prior to crop growth to limit overwintering TPB populations. Row covers work well to protect buds and flowers on young plants, but may not be

practical for mid-summer use. A key for management is practicing good weed control, since TPB is more of a problem in weedy areas.

There are several natural enemies of TPB including the big-eyed bug (*Geocoris punctipes*) and the native parasitic wasps *Peristenus pallipes*, *Leiothron uniformis*, and *Anapbes orientatus*. *Peristenus digoneutis* has received the most attention and is a safe, non-native parasite that has been established in the Northeast. The wasp injects its egg into a young TPB nymph. When the egg hatches, the young parasite kills the TPB in about 10 days before it can reproduce and further damage plants.

Notes from the field

Vermont crop growers know the tarnished plant bug well. Most growers will tell you that timing is everything. Bruce Kaufman of Riverside Farm in East Hardwick said he also relies on hope and prayer along with the right weather. He sees the pest mostly on lettuce and broccoli and doesn't spray specifically for the pest anymore. Applications of *Beauveria bassiana* on strawberries were really hit or miss. His biggest tactic is to time the field mowing around plantings of lettuce and broccoli. Bruce always plants more of these crops than he needs and lives with a small amount of damage. He also tries to keep plants healthy, since stressed plants are more susceptible to attack. About 10 years ago he introduced the parasitic wasp *Anapbes*, but because the wasps are so small, it was hard to tell if they were doing their job. Overall populations are now lower on his farm and this could be due to the parasitic wasp populations.

For Paul Betz of High Ledge Farm in Calais, the timing of field mowing is also critical. His farm is surrounded by 70 acres of hay fields. The timing of the harvest will determine the amount of damage he'll see from TPB. Paul doesn't grow strawberries or eggplants because they are so susceptible to damage. Some years he sees significant damage on pepper crops when TPB causes dropped blossoms. Last year the pest was particularly hard on the late season lettuce crop. Paul doesn't spray for TPB, since he hasn't found anything to be that effective. Because the pest is a true bug, with a hard shell, it is difficult to kill. Row covers protect plants in spring, but are not practical by mid-season, since they can significantly elevate temperatures under

the cover, leading to heat damage or hold moisture and lead to rot problems in a wet year.

Tarnished plant bug populations are the worst after a hot spring, therefore a cold spring is better for control says Joey Klein of Littlewood Farm in Plainfield. A year with a hot spring means that TPB populations can get quickly out of control. He witnesses the most damage on strawberries, peppers, lettuce and Swiss chard. Like Bruce and Paul, Joey is careful about mowing when neighboring crops are susceptible and keeping weeds under control. In addition, crops are sprayed with a fish and seaweed foliar fertilizer to ensure adequate nutrition. In his strawberry crop, Joey scouts for the pest. He shakes ten fruit clusters and counts the nymphs. A threshold level is one nymph per cluster, or ten nymphs total. Joey has found that a combination of Naturalis L (*Beauvaria bassiana*) and PyGanic helps keep populations under control. He will also be enlisting the help of a beneficial insect this year, the spined soldier beetle. This voracious predator pierces and literally sucks the life out of its prey.

These organic farmers all rely on a multi-dimensional approach for pest control. This holistic approach differs from the conventional view of pest eradication. Organic growers use as many tools as possible to keep pests like tarnished plant bug under control, but do not strive for pest elimination. Instead, they accept a certain percentage of loss from this and other pests. If you find tarnished plant bug to be a problem this season, start experimenting with some of the methods described above and consider yourself in the good company of Vermont's many experienced growers.



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