Biological Control

There were no effective natural controls of the TPB in the U.S., so scientists at the USDA Biocontrol Laboratory (Newark, DE) initiated a search for a safe natural enemy. In France USDA explorers discovered a tiny wasp (*Peristenus digoneutis*) attacking TPB.

This parasite was established in northern NJ, by the Newark Laboratory in 1984. Since then, this tiny wasp has spread into 8 states, throughout New England, NY, and northern PA. In the photo below, a wasp is injecting its egg into a young TPB nymph. The egg soon hatches, and the young parasite kills TPB in about 10 days, before it can reproduce, and further damage plants.

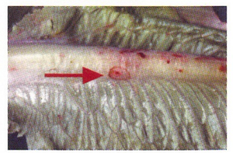
Parasitic wasp laying eggs in TPB

During the past 10 years, TPB numbers in NJ alfalfa have been reduced by 63% by this parasite, and in NH damage to apples has been reduced 65%. Research is needed to learn if TPB damage to strawberries and other fruits and vegetables has also been reduced.

Damage

The green bean on the left has been damaged by TPB

TPB feeds on most vegetable and fruit crops grown in the northeastern U.S., including apples, peaches, strawberries, brambles, lettuce, eggplant, beans, and tomatoes. Fruit crops near weedy fields, alfalfa, and hedgerows, where TPB overwinter, can be severely damaged when TPB pierce plant tissue and suck-up the sap. They feed on fruit, flowers, and along leaf stems and veins. This causes blossom and fruit drop, malformed fruit, and other plant damage. Sometimes TPB feeding punctures provide access for disease invasion.



Basal rib of romaine lettuce showing TPB feeding and bacterial infection (arrow)

Where can TPB be found?

They can be found year round in the weeds and vegetation at field edges. During the growing season they are abundant on vegetables, alfalfa and flowering weeds. Redroot pigweed (*Amaranthus retroflexus*) is a favored host. Because they fly or jump when disturbed, it is sometimes difficult to see or catch them.

Flowering alfalfa

The Pest

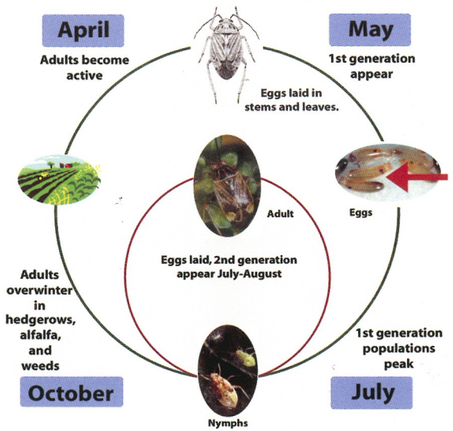
TPB nymphs

Tarnished plant bug, *Lygus lineolaris* (TPB) is a major pest of many crops throughout the northeastern United States. Adults (1/4 inch long) are brown, with yellow, orange, or red tints and a small whitish "V" on the back. Their eggs are laid inside plant tissue. Nymphs are yellowish to bright green, and pass through 5 stages, called instars. The 1st and 2nd instars look like aphids, but are more active and move faster. The 3rd - 5th have five black dots and developing wing pads on their backs.

Life Cycle

In late April, adults become active in weeds, hedgerows, and alfalfa. They feed, lay eggs, and then die. The nymphs hatch and immediately begin to feed, reaching adulthood in about 25 days. The overwintering adults and the first generation nymphs are responsible for most of the damage to fruit. When populations are high, the second generation of TPB causes damage to vegetables. In the fall, adults seek shelter in alfalfa, weeds and hedgerows to overwinter.

Tarnished Plant Bug Life Cycle*



* May vary depending on geographical location

For more information on the biological control of TPB,

Call: USDA-BIRL, Newark, DE at (302) 731-7330 ext. 224

For copies of this brochure, call:
(302) 731-7330
(802) 656-5434

Designed by Jane Stewart

Recognizing Tarnished Plant Bug Damage

Vegetables, Fruits, Herbs

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[1]University of Vermont, Entomology Research Laboratory

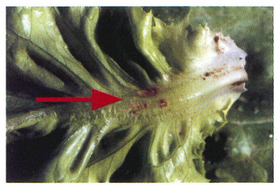
[2]USDA-BIRL, Newark, DE

Symptoms of Damage by Tarnished Plant Bug (TPB)

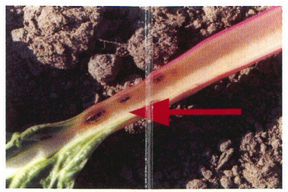
Accurate damage diagnosis is critical for effective pest management. TPB causes a variety of damage symptoms, depending on the affected plant part. Sometimes there is no sign of damage at all. For example, if TPB feeds on young eggplant or tomato blossoms, the flowers fall off. In contrast, when they feed on strawberry flowers, deformed fruit results. Below are photos of TPB damage on different crops. These symptoms were verified by laboratory feeding trials or repeated field observations to ensure that the damage was actually caused by TPB.

Leaf Stems and Ribs

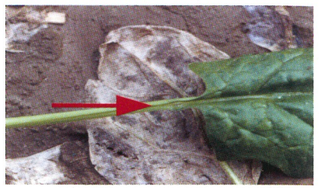
Feeding results in localized discolored patches, scabs, and small empty spots. Severe injury disrupts sap flow, causes wounds in plant tissue, and allows entry of disease.



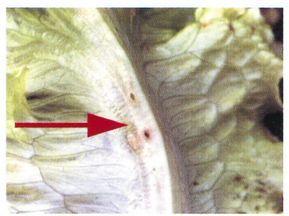
Boston Lettuce



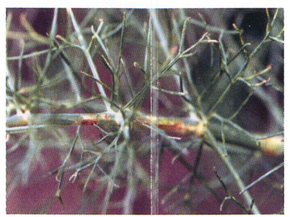
Red Swiss Chard



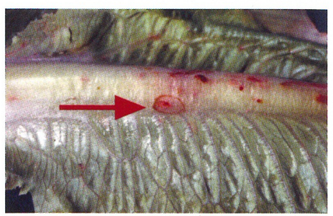
Spinach



Red Leaf Lettuce



Fennel



Romaine Lettuce

Savory Cabbage

Green Leaf Lettuce

Celery

Flowers and Flower Buds

Feeding causes flowers or flower buds to drop off.

Green Pepper

Tomato

Sunflower

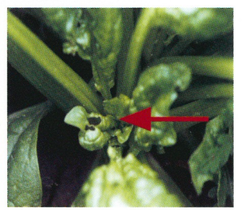
Broccoli

Leaf Buds

Feeding on young leaves can result in shot holes and tip dieback upon expansion.

Celery

Basil



Spinach

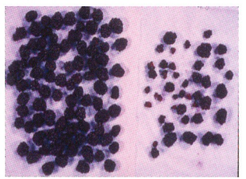
Asparagus

Fruits and Seeds

Feeding can result in deformity, reduced yields, and reduced germination of seeds.

Strawberry

Apple

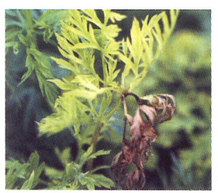


Blackberries

The berries on the right have been damaged by TPB. (Courtesy of Cornell / Geneva)

Leaf Stalks

Feeding disrupts tissue at the base of the leaf, causing dieback of the whole leaf.



Carrot

Fennel