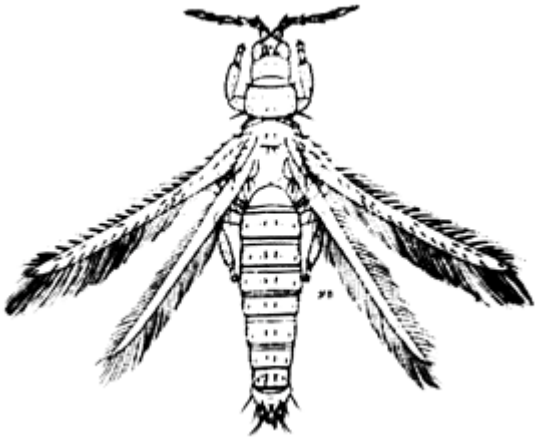
Sugar Maple and the Pear Thrips

Taeniothrips inconsequens (Uzel); Family: Thripidae

Maple leaf damage from Pear thrips
From forestryimages.org
Ronald S. Kelley,Vermont Department of Forests Parks and Recreation.



Pear thrips adult (actual size approx. 1/16 inch long).
From Borrer et al. 1981.

An adult pear thrips.
Photo from Pennsylvania Dept. of Conservation & Natural Resources, Forestry Archive, Bugwood.org

Pear thrips larvae clustered on a leaf on the ground, after being washed off the tree leaves by heavy rain,
in late May, just prior to going underground to pupate.
Photo by S. Gardescu, © 1989.

History and Hosts

This tiny insect can cause major leaf "tatter" and flower damage on sugar maples and orchard trees, by feeding and laying eggs on the young leaves and flowers as the buds open in spring.

The pear thrips species is native to Europe or Eurasia, but was present as early as 1900 in California orchards, and likely by about 1907 in orchards in New York State (Bailey, 1944; Parrott, 1912). In the past the pear thrips was primarily considered a pest of plum, cherry, apple, and pear (Bailey 1944, Borror et al. 1979). However, maple species are also preferred hosts, both in Europe and North America (Bailey 1944, Cameron & Treherne 1918, Morison 1948). The pear thrips was first noticed as a pest of sugarbushes and forests in the Northeast in the 1980s, when sugar maple foliage showed major damage in areas of Vermont, Pennsylvania, and nearby states (Parker et al. 1988).

Other trees that can be affected include beech, amelanchier, and black cherry (Teulon et al. 1994). Feeding damage by larvae is also found on many non-tree plants growing under the forest canopy or beneath orchard trees. In Europe, this insect is associated with forests more than orchards (Lewis 1973).

Description

The adult pear thrips is tiny, 1.2 to 1.5 mm long, with a slender brownish body. Its head is swollen behind the eyes, which are reddish. Antennal segments V and VI are broadly jointed, and the third segment is yellowish brown. Tarsi are yellowish-brown and the fore tarsi have an apical tooth adapted for digging. Wings are long, narrow, and (like other thrips species) fringed with long hairs. The forewings are brown and the hind wings are pale.

Pear thrips larvae (sometimes called nymphs) are small and white, with red eyes. A distinctive ring of black or brown spines near the tip of the abdomen differentiates it from larvae of some other thrips species (Bailey 1944).

Note that "thrips" is the correct term both for one thrips, and for multiple thrips.

Life Cycle

There is only one generation per year, and populations do not increase over the summer. In the Northeast, adults emerge from underground usually in April, depending on spring temperatures, and begin feeding and laying eggs on the developing foliage and flowers of host trees (Parrott 1912, USDA 1921-1942, Teulon et al. 1998). Adults may be present from late March to May, in the Northeast. In late May, the larvae drop from the tree canopy and go into the soil, where they pupate and become adults in autumn (Parrott 1912, Teulon et al. 1998). Thus, most of the year is spent underground, not feeding.

Only female pear thrips have been found in North America, where they reproduce asexually (parthenogenesis), whereas both sexes are present in Europe (Teulon et al. 1994). Eggs are laid mainly in the petioles of blossoms and leaves, as soon as buds open. Egg laying is performed with a sharply pointed down-curving, saw-toothed ovipositor. Small brown scars develop soon after eggs are laid.

Both adults and larvae feed on young leaves and developing flowers and fruits. After two or three weeks of feeding, the larva drops to the ground and enters the soil. There it forms a protective cell within which the thrips remains until the following spring. Strong spines on the 9th and 10th abdominal segments are used to penetrate the soil and mold the cell. Most are found in the upper 4 inches of soil, but some are as deep as 12 inches, in better-drained soils (Teulon et al. 1998). In autumn, the insects pupate within the cells and develop into adults.

Adult pear thrips emerge from their underground cells in spring when soil temperatures warm: as early as February in California (Bailey 1944), but primarily in April in the Northeast (Parrott 1912, USDA 1921-1942, Teulon et al. 1998). The adults fly to the expanding leaf and flower buds, and begin to feed and lay eggs. They may migrate to other trees or nearby orchards, especially in years of high abundance or when the tree buds have not yet opened.

Injury

Because pear thrips spend most of the year dormant underground, often by the time tree damage is noticed in summer the insects are no longer present to be seen and identified.

Foliar damage is caused when pear thrips scrape and rasp tender plant tissue with their sharp, needle-like mouthparts to feed on plant liquids. Leaves damaged by the pear thrip are dwarfed, mottled yellow to green-brown, and distorted. This causes the tree to have a thin crown, and the effect resembles late frost damage. Blister-like scars from feeding and egg-laying develop along the veins and petioles of the foliage. Moderately damaged foliage can place the trees under some stress. Severely damaged foliage can occasionally result in early spring defoliation followed by refoliation in June or July. Sugar maple flowers and flower stalks are also damaged by egg-laying and by the feeding of adults and larvae.

In orchards, damage to flowers and fruits as well as leaves was a problem in certain years early in the 1900s, but became less of a problem with widespread use of insecticides to control other orchard pests (Bailey 1944,USDA 1921-1942). Pear thrips is now considered less important in West Coast orchards than other

thrips species. However, in the year 2000 pear thrips caused notable damage in Oregon orchards, especially ones near forest stands of bigleaf maple (Reidl 2001).

Damage to leaves and flowers is most severe in years when the timing of adult emergence from underground is synchronized with bud opening, especially when cool weather after budbreak extends the period of leaf expansion.

Management

A year of heavy damage is often followed by years with minimal impact, depending on spring weather conditions during budbreak. Damage is generally less in years when leaf expansion occurs rapidly, unless pear thrips populations are extremely high.

No insecticides can be recommended at this time to control pear thrips. Pear thrips have natural enemies in North America (Lewis 1973), but the importance of such insects in controlling thrips populations is not known. Several kinds of fungal pathogens have been found on pear thrips in the soil (Brownbridge et al. 1999).

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