

THE LIFE CYCLE OF PEAR THRIPS, *Taeniothrips inconsequens* (Uzel) IN VERMONT

Margaret Skinner, Bruce L. Parker and Sandra H. Wilmot¹

Entomology Research Laboratory
The University of Vermont
South Burlington, Vermont USA

Life history information has been collected for pear thrips in orchard habitats in California and British Columbia (Cameron & Treherne 1918, Bailey 1944). However such information is not available for this insect in a northern hardwood forest ecosystem in the eastern United States. Research is currently underway at the University of Vermont to determine the pear thrips life cycle in Vermont sugarbushes. These data are urgently needed to assist researchers and forest managers in their efforts to develop methods to effectively manage this pest. Results from 1988-89 are presented here to provide preliminary life cycle information. Research is continuing to determine annual trends and variations in the pear thrips life history and to correlate these variations with weather conditions.

Adult Emergence

Based on observational information, adult pear thrips emerged from the soil around 15 April 1988 in southern Vermont (B. Burns, personal communication). When they first emerge, these adults are light brown in color, but soon after emergence they turn dark brown or black (Fig. 1).

¹ Vt. Agency of Natural Resources, Dept. of Forests, Parks and Recreation, Waterbury, Vt.



Figure 1. Pear thrips adult female on leaf vein of sugar maple (photo by T. E. Downer).

Feeding

Pear thrips ascend to the canopy after emerging from the soil to seek opening buds, into which they crawl and begin feeding. The most severe damage to maple leaves occurs as a result of thrips feeding for a prolonged period within the partially opened buds. Brown margins on developing leaves at the tip of opening buds are the characteristic early signs of thrips damage (Fig. 2).



Figure 2. Characteristic pear thrips damage on sugar maple buds as they begin to open.

Oviposition

Soon after emergence pear thrips commence oviposition. Eggs are laid on the undersides of leaves primarily in the mid-veins, and less commonly in secondary veins. Oviposition also occurs on the leaf petiole. A brownish scar remains in the leaf tissue after the thrips larva hatches from the egg (Fig. 3).

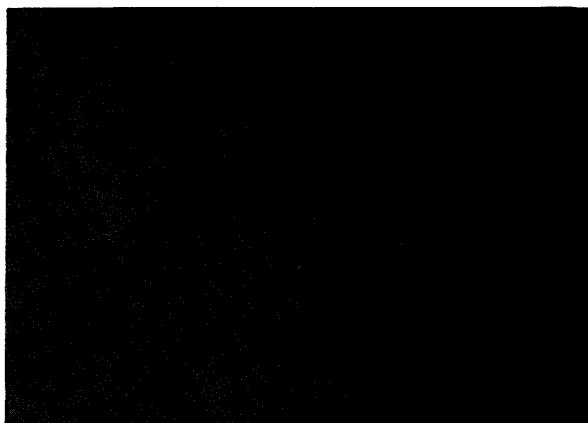


Figure 3. Pear thrips oviposition scars along the main vein on the underside of a sugar maple leaf.

Larval Hatch

In California, larvae hatched from the egg in the leaf within 6 - 7 days, depending on temperature (Bailey 1944). It is likely that pear thrips in Vermont require a similar incubation period. Based on our observations, once hatch begins, the first instar emerges from the egg within 20 - 30 minutes. The larva, with the characteristic red eyes visible, wiggles vigorously to free itself from the egg (Fig. 4).

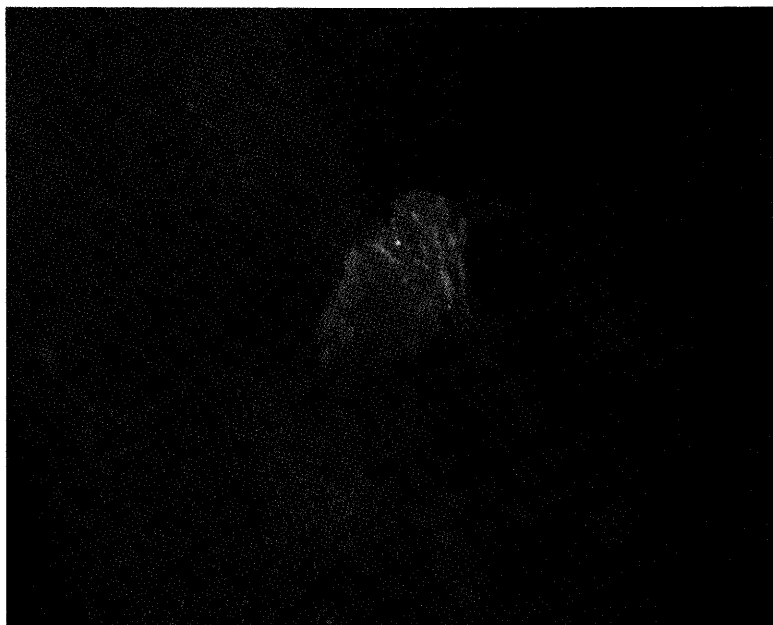


Figure 4. A pear thrips larva hatching from an egg within the leaf vein. The characteristic bright red eyes are clearly visible (photo by T. E. Downer).

Larval Development

Pear thrips have two instars. First instars are slightly smaller than seconds, but it is difficult to differentiate the two (see Nakahara, this publication). The second instar is fairly distinctive, having a prominent ring of sclerotized spines at the base of the abdomen that are visible at 10x magnification (Fig. 5). Larvae can be found commonly congregating on the undersides of leaves at the base of the leaf veins.

Second instars drop from the foliage in early June. They can be found on a wide variety of ground vegetation. Significant damage to first- and second-year sugar maple seedlings can occur as a result of feeding by thrips larvae at this time of year. By the end of June most of the larvae have left the foliage to enter the soil. Once in the soil they construct an overwintering chamber by tamping down the sides of the cavity with their abdomen (Bailey 1944). Though basically inactive once in the soil, they will move about if disturbed.

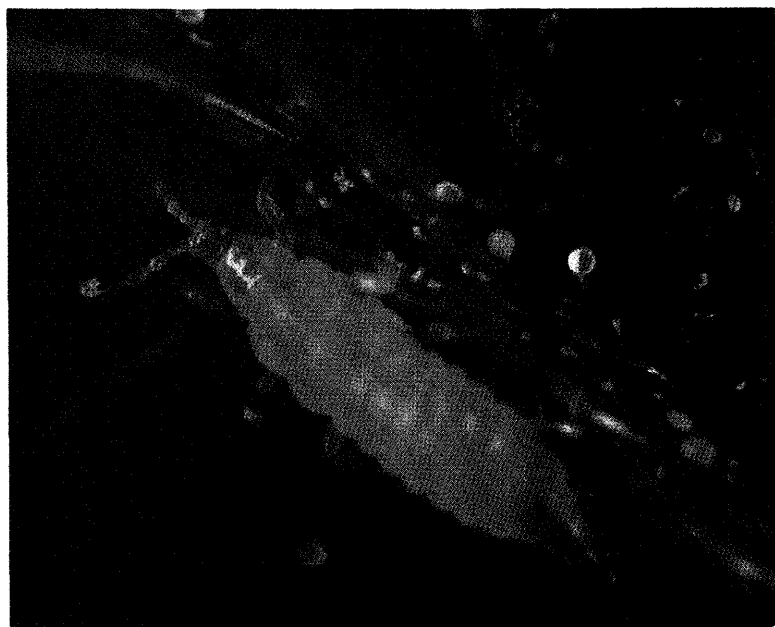


Figure 5. Second instar pear thrips (photo by T. E. Downer).

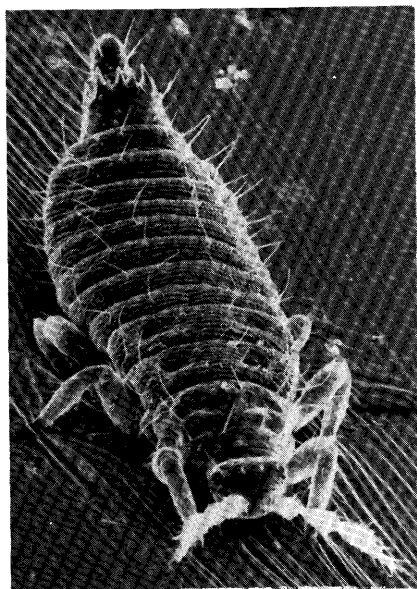


Figure 6. Second-instar pear thrips (SEM by G. M. Hendricks).

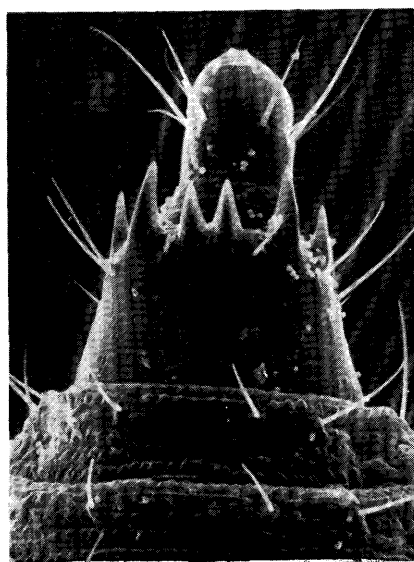


Figure 7. Abdominal spines on second-instar pear thrips (SEM by G. M. Hendricks).

In Vermont, pre-pupae and pupae (Fig. 8 and 9) were first found in soil samples taken on 15 September 1988. The fact that both life stages were found simultaneously suggests that the pre-pupal stage is relatively short. The differences between the two stages are difficult to distinguish because development is gradual. The wing pads slowly elongate, ultimately reaching beyond the base of the abdomen at which time it is considered a pupa.

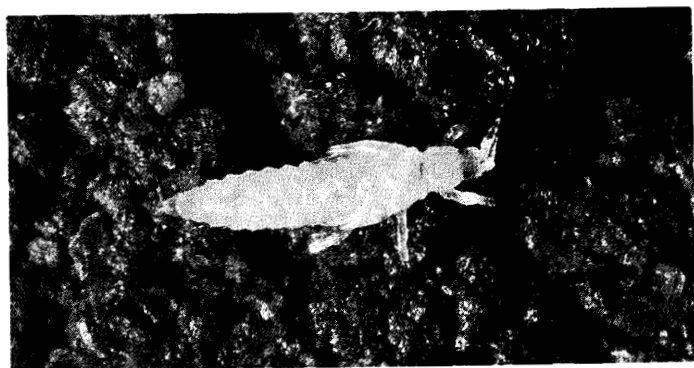


Figure 8. Pear thrips pre-pupa (photo by T. E. Downer).



Figure 9. Pear thrips pupa (photo by T. E. Downer).

Adulthood

Pear thrips transformation to adulthood is gradual. Though they still resemble pupae, being fleshy, soft-bodied and whitish in color, fringes on the wings can be detected in the early stages (Fig. 10). Pear thrips finally complete adult development, but remain a light honey color (Fig. 11). Completion of the tanning process occurs after they emerge from the soil in spring.



Figure 10. Pear thrips collected from the soil during transformation from the pupal to adult stage. Note the soft-bodied appearance suggesting the pupal stage and fringes on the wings, an adult characteristic (photo by J. K. Clark).

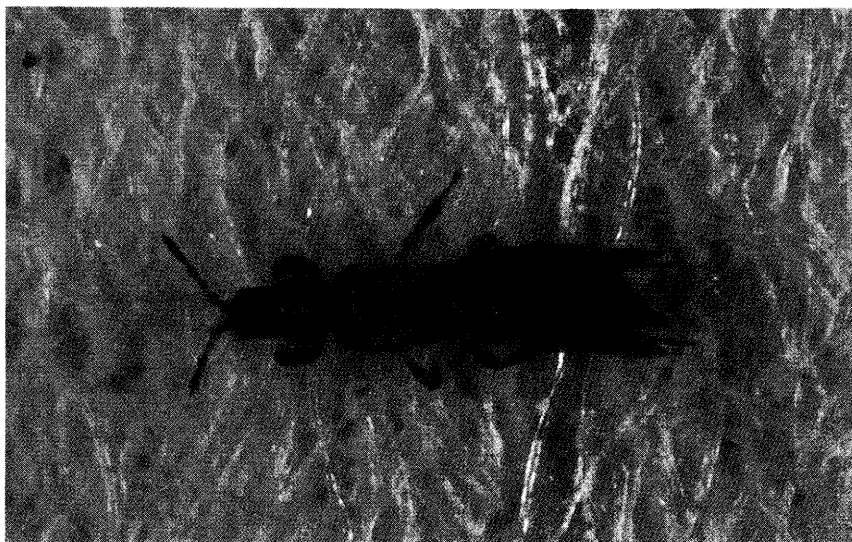


Figure 11. Teneral adult pear thrips collected from the soil (photo by T. E. Downer).

Table 1. Pear thrips, *Taeniothrips inconsequens* (Uzel), life cycle information. Central and southern Vermont sugarbushes, 1988

Event	Date
Emergence of adults from the soil	15 April
Second instar enters the soil	15 June
Prepupae and pupae found in the soil	15 September
First adults collected in the soil	26 October
Last pupa found in the soil	11 November

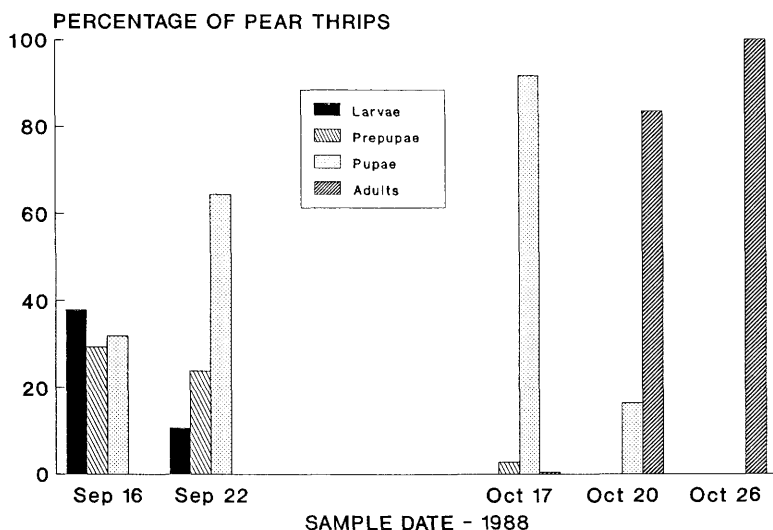


Figure 12. Percentages of life stages of pear thrips, *Taeniothrips inconsequens* (Uzel), found in soil samples taken in Randolph, Vt.

References Cited

- Bailey, S. F. 1944. The pear thrips in California. Univ. of Calif. Bull. 687. 55 pp.
- Cameron, A. E. & R. C. Treherne. 1918. The pear thrips (*Taeniothrips inconsequens* (Uzel)) and its control in British Columbia. Can. Dep. Agric. Entomol. Branch Bull. 15.