

Barley Thrips

Biology and Control

Nancy A. Matteson
Larry E. Sandvol
Robert L. Stoltz
James C. Whitmore
Jay Hanson
Steve L. Peebles
Melinda Morrison

The barley thrips (*Limothrips denticornis* Haliday) is a newly identified pest in Idaho. It has caused economic damage only in barley but occurs in other winter grains, in spring wheat, and in early spring grasses. Although barley thrips are present on plants every season, their most serious damage has occurred in dryland cropping areas after several years of drought. Areas with overhead sprinkler irrigation systems; cool, wet weather; and vigorously growing crop plants are typically associated with fewer barley thrips and reduced feeding damage. Drought conditions, in combination with drought-stressed plants, may allow barley thrips populations to increase to levels that result in crop losses.



Figure 1. Barley thrips feeding damage, 1990. Note areas of reduced growth and lighter color.

Damage

Adult and immature (larval) stages of barley thrips feed on succulent plant tissues. Immature stages do damage equal to or greater than the adult stage. Both adults and immature thrips feed by puncturing plant cells and sucking

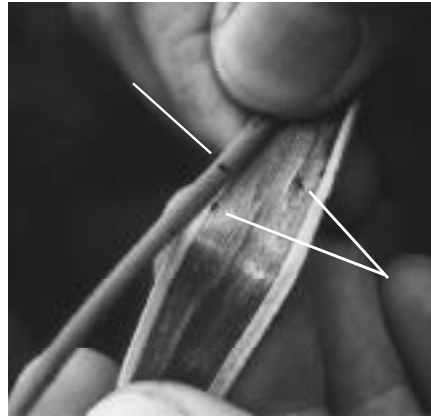


Figure 2. Adult barley thrips found by unrolling the flag leaf away from the stem.

out the contents. This results in the loss of color and, as the damage progresses, drying and death of the leaves, stem, and grain head.

Feeding damage causes symptoms that include a characteristic whitened or bleached appearance of the plants (fig. 1). Increased feeding damage results in misshapen or gooseneck-shaped stems and heads. Pollen feeding by barley thrips may result in poor head filling and reduced seed germination.

Description

Thrips may be located on the plant by gently unrolling the leaves and examining the internal leaf sheaths and stem (fig. 2). Barley thrips adults are dark brown to black and 1.1 mm to 1.8 mm (0.04 to 0.07 in) long (fig. 3). Immature barley thrips are white or light yellow and 0.25 mm to 1.8 mm long. Early stages are difficult to see due to their light, almost transparent color and extremely small size. Adult and immature thrips have long, narrow bodies and usually appear pointed at both ends.

Identification is aided by observation through a magnifying lens, hand lens, or microscope. An obvious diagnostic characteristic that occurs on adults only is a tooth-like projection on the third segment of the antenna. (fig. 3)

Distribution

The barley thrips is found from Canada to the central United States but is native to Europe and parts of Asia and Siberia. It was first found in the United States in New York in 1923. By the early 1950s it had been observed in large numbers in North Dakota spring barley.

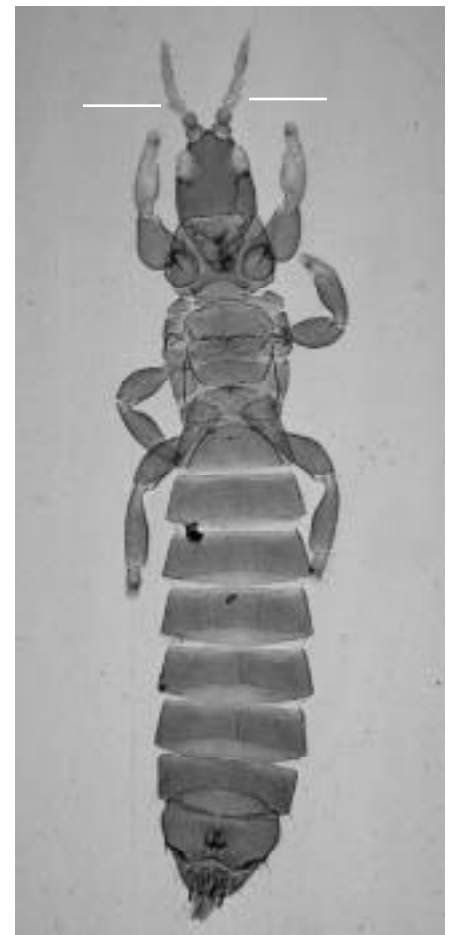


Figure 3. A slide-mounted barley thrips shows the tooth-like projection on the third antennal segments.

Barley thrips were first confirmed in Idaho in Teton County barley in 1990. During the summer of 1992 this new pest was collected in suction trap samples from Bonners Ferry, Moscow, Lewiston, Craigmont, Tetonia, and Ririe. However, economic damage by barley thrips in malt barley has been reported only in western Idaho in Fremont and Teton counties.

Biology

Barley thrips biology was studied by University of Idaho scientists in Teton County during the 1992, 1993, and 1994 growing seasons. Based on those studies, we determined the barley thrips life history in Idaho.

Adult, overwintering females occur in the soil beneath aspen and sagebrush plants. Females leave the overwintering sites from late April through early June and disperse to winter grains and early spring grasses. No feeding damage is observed during that time, and no immature thrips are found in these grasses.

Later in the spring and in the early summer the adult females migrate to developing barley. Adult females are found in malt barley at the three-to-four leaf stage, but damage is not observed during the early season.

Females begin laying eggs, up to 100 per female, in the tissue of upper leaf sheaths as the plants mature. Eggs hatch within three to ten days from early July through late August, and larvae begin feeding on leaf tissue. Most feeding damage occurs at this time.

During the three-year study the overwintering females produced only one generation (first generation) per year. The first-generation females mate, leave the plant at crop maturity, and migrate to overwintering sites. Adult first-generation males are wingless and remain on the barley after mating. The males do not overwinter.

Control

Chemical control is the only proven method of controlling barley thrips. The decision to treat a barley field with

any registered compound should be based on the results of regular, thorough sampling in the field, beginning when the flag leaf is first visible. Because treating for thrips is not effective in preventing yield loss after heading, regular sampling in fields is important when the flag leaf is first visible and until the head has completely emerged from the boot.

Treating for barley thrips to prevent yield loss should be done before heading is complete. Treatments applied during and after soft dough stages are not recommended.

Determining when to treat

Use the following method to determine whether treatment for barley thrips is required:

1. First calculate a **threshold number** by dividing the current cost of control (cost of insecticide + cost of application) by the expected value of the crop at harvest. Then divide this value by 0.4.

Threshold number =

$$\frac{\text{Cost of control} \div \text{Expected value per bushel (\$)}}{0.4}$$

2. Next sample the field to determine the number of thrips per stem.
3. Divide the total number (adults and immature) of thrips counted by the total number of stems collected. This value is the **observed number** of thrips per stem.
4. Compare the observed number of thrips per stem with the calculated threshold number. If the observed number of thrips is *equal to or greater than* the calculated threshold, treatment is recommended. If the observed number of thrips is *less than* the threshold number, treatment is not recommended, but sampling should continue until heading is complete.

Observed \geq Threshold = Treat

Observed $<$ Threshold = Do not treat, but sample again later

Contact the University of Idaho extension educator in your county for further assistance and for current information on rates and changes in labeled products.

Sampling for barley thrips

Sample by collecting whole stems throughout the field. Because thrips usually concentrate at the field edge or other protected areas, start taking stem samples near the edge of the field and then at regular intervals as you walk toward the center of the field. Collect at least 25 stems; sampling accuracy improves if you sample more stems (50 to 100 stems).

Unroll the leaf sheaths away from the stem to find and count the dark adult thrips and light-colored immature thrips. Both adult and immature stages may infest the emerging grain head, so examine it as well and count any thrips you find. Include the adults and immature stages in the total count because feeding by both larvae and adults damages the plant.

The authors – Nancy Matteson, Extension Entomologist Support Scientist, UI Twin Falls Research and Extension Center, Department of Plant, Soil, and Entomological Sciences; Larry E. Sandvol, Extension Entomologist and Superintendent, UI Aberdeen Research and Extension Center, Department of Plant, Soil, and Entomological Sciences; Robert L. Stoltz, Extension Entomologist, UI Twin Falls Research and Extension Center, Department of Plant, Soil and Entomological Sciences; James C. Whitmore, Superintendent, UI Tetonia Research and Extension Center; Jay Hanson, Extension Educator, Teton County; Steve L. Peebles, Extension Educator, Fremont County; Melinda Morrison, Irregular Help, UI Tetonia Research and Extension Center.