

Insects

The Hessian Fly in Wheat

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The Hessian fly is a pest of winter wheat in Tennessee and other wheat-growing states. This pest caused disastrous losses in Tennessee wheat in the mid-1980s. Later planting of wheat and the use of wheat varieties resistant to Hessian fly minimized economic losses from this pest. In the coming years, potential economic losses from Hessian fly could increase due to the lack of resistance varieties.

In 2009, very little attention was given to Hessian fly infestations. However, there are some varieties with moderate resistance to biotype L Hessian fly. None are completely resistant. Some of the better methods to reduce Hessian fly infestations are to rotate the crop out of wheat or tillage by plowing under all the stubble in the field. These seem to be the better methods at present than waiting for a new wheat variety.

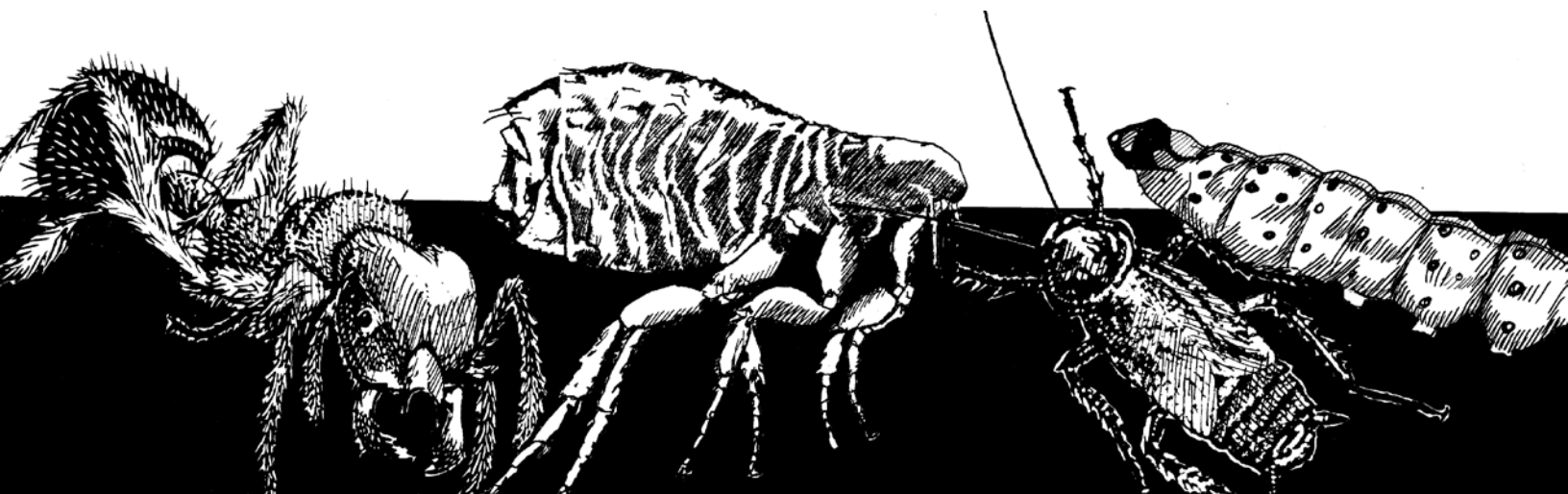
This publication discusses the biology of the Hessian fly and provides suggestions for managing this insect. Historically, Hessian fly has caused the greatest problems in the southern two-thirds of Alabama. Outbreaks of this insect have occurred periodically in the United States since the mid-1800s. The Hessian fly is believed to have been introduced into Long Island, New York, in straw bedding used by Hessian soldiers during the Revolutionary War. Hessian fly

prefers to feed on wheat, but may also infest triticale, barley and rye;

Description and Life Cycle

The Hessian fly is a small, mosquito-like fly, about 1/8-inch long. Adult females live one to two days and lay reddish-colored eggs (Figure 2) in grooves on the upper side of wheat leaves. Each adult female can lay 250 to 300 eggs on the fall-planted wheat. The maggots (larvae) hatch from the eggs after three to 10 days. Hessian fly maggots cannot live in the open, so they crawl down to their preferred feeding site, at the base of a leaf sheath, between the sheath and the stem. In the fall, the maggots crawl down to the crown of the plant. As the wheat stem elongates, maggots are usually found just above a leaf node. Infestations of Hessian fly tend to be found further up the plant as the stem elongates, because females prefer to lay eggs on newly emerged leaves. Newly hatched maggots are reddish-brown and about 1/50-inch long. As they grow, they become white, then greenish-white, and grow to be about 3/16-inch long.

The maggots feed by scraping the stem, then sucking up the sap that oozes out of the wound. The maggots feed for 14 to 30 days. The last stage of the maggot is spent inside the "flaxseed." The flaxseed is a shiny,



brown protective case about 1/8-inch long. It is built from the insect’s skin, and named for its resemblance to a seed from the flax plant. If weather conditions are favorable (between 40 to 80 degrees F), the Hessian flies will pupate (transform into adults) inside the flax-seed. Adults then emerge and start a new generation.

Damage to wheat includes stunting of plants and can kill seedlings. It is believed the flies inject a toxic substance into the plants. When wheat planted in the fall is infested with Hessian fly, yield losses can occur at maturity of the crop. Wheat exhibits weaker stalks, causing lodging. Also, the wheat heads are not fully developed, causing the lower-quality seed.

Management Decisions

There are some methods to reduce potential Hessian fly infestations. Cultural measures include plowing

under infested plants after harvest. Host plant resistance has been useful in past years, but the insect has adapted to the present biotypes. In Tennessee, we have now Biotype L, to which very few varieties exhibit any type of resistance.

Burying wheat stubble will also help reduce Hessian fly populations. Control volunteer wheat by using a herbicide to kill any that exist. This will prevent the fly from infesting them and reduce the source of Hessian flies. The fly-free date in Tennessee has done little to reduce infestations due to warmer winters in past years. Crop rotation helps to prevent infestations.

Few insecticide options are available to control Hessian Flies in wheat (Table 1). Plant as late as possible without causing damage to the wheat by exposing to freezing weather conditions.

Table 1. Recommended Insecticides.

Material	Rate	Comments
Gaucho 480	2 fl. oz / 100 lbs seed	Seed treatment
Gaucho 600	1.6 fl. oz / 100 lbs seed	Seed treatment
Gaucho XT plus	3.4 fl. oz mixed with 1 fl. oz Gaucho	Seed treatment
Cruiser 5FS	1.33 fl. oz / 100 lbs. seed	Seed treatment
Warrior IICS	1.92 fl. oz / acre	
Karate Z	1.92 fl. oz / acre	

Following are photos of the Hessian fly, flaxseed and immature forms. Photos courtesy of Bugwood.org. All photos are used in this publication for educational use only.



Figure 1



Figure 2

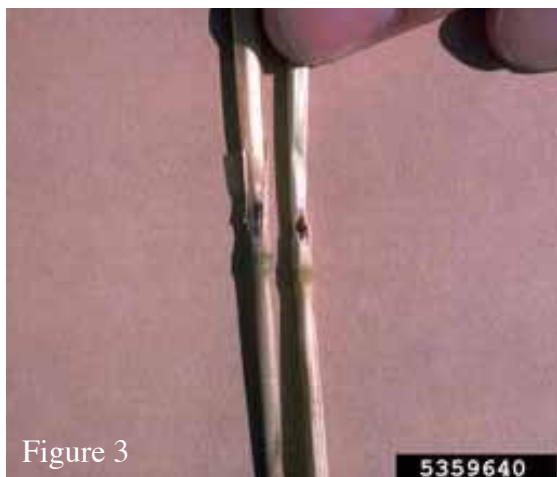


Figure 3



Figure 4

Figure 1, Hessian fly larva. Photo by Peggy Greb, USDA – ARS.

Figure 2. Adult Hessian fly. Photo by Scott Bauer, USDA – ARS.

Figure 3. Hessian fly damage. Photo by R.L. Croissant and Howard F. Schwartz, Colorado State University.

Figure 4. Illustration by Art Crushman, USDA – ARS.

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label. Persons who do not obey the law will be subject to penalties.

Disclaimer Statement

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide registrations are continuously reviewed. Should registration of a recommended pesticide be canceled, it would no longer be recommended by the University of Tennessee. Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others which may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

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