

Kansas State Agricultural College

EXPERIMENT STATION

ENTOMOLOGICAL DEPARTMENT

Hessian Fly and Greater Wheat Straw-Worm

Although the damage from Hessian fly may show a marked reduction this year, limited localities will suffer severely from it and the greater wheat straw-worm. The grower should go into his field at harvest time and ascertain whether these insects have been doing him harm, and, should he find them, take measures to prevent them from working harm to his next year's crop. To help him in following these suggestions this bulletin describes how the work of these insects may be recognized and gives practical methods of preventing their injury. Attention has been confined to them because they, of the insects most likely to damage the 1910 crop seriously, are the ones against which effective measures may be taken between now and next wheat-sowing time.

How to tell the work of Hessian fly.

The wheat stem is marked at intervals with ring-like enlargements known as joints. Arising from the upper edge of these joints, the basal part of the leaf winds tightly about the straw for some distance upward, then branches off as the ordinary leaf-blade. The straw infested with Hessian fly breaks over just above a joint, which, while it varies considerably in location, is usually a relatively short distance above the ground. If the grower will carefully pull the leaf away from the stalk where it is broken over, he will find lying in a little dent lengthwise in the straw an oval, dark-brown, seed-like body one-fourth of an inch or less long. This is the "flaxseed" stage of Hessian fly and is sometimes improperly spoken of as the "egg" of the fly. Sometimes, through careless handling or other causes, the "flaxseed" will be gone and only the little dent in the straw left as evidence of its former presence. If the grower does not find the "flaxseed" in the first examined, he should continue to examine broken straws until he does find it, or until he is convinced that the fly did not do the work.

How to tell the work of the greater wheat straw-worm.

Like Hessian fly, the work of this insect becomes evident at harvest time. The location of the point at which the infested straw breaks over varies considerably, but is usually a relatively short distance below the head. If the wheat grower will take his pocket-knife and split the broken straw from end to end he will find either in or just above a joint, entirely inside the straw, a small greenish-yellow grub, less than one-fifth of an inch long. Sometimes the grub will have been sliced and destroyed by the knife and the grower must continue to split the fallen straws until he finds it, or is satisfied that the damage is due to some other cause.

How to control Hessian fly.

The practice of following wheat with wheat, while exceptionally favorable to the increase of fly, is so general in our large wheat-growing counties that the "steps" in fly-control have been selected and tested in accordance with this practice. Those desiring to use rotation as a means of controlling the fly and straw-worm would do well to consult a more extended treatment of these insects.

Steps in its control.

1. *Disking.* — The disk should follow the binder or header just as soon as possible. This will throw out a large percentage of the flax-seeds, that would otherwise be protected by lying in the stubble below the surface, so that their parasitic enemies can attack them. The disking will conserve the soil moisture, render the plowing easier, and start the volunteer wheat and the weeds.

2. *Plowing.* — Follow the disk in from two to four weeks by the plow. Set the plow to run five or six inches deep and so completely turn the land that all fly-infested stubble, volunteer wheat, weeds and rubbish generally, shall be thrown exactly into the bottom of the furrow and the whole sur-

face slice turned over on it. Compact this plowed land into a good seed-bed with implements that will not pull the stubble to the surface, and you will have four or five inches of compact soil between the fly and daylight. Very few of the flies thus covered will ever get out. Experiments at Manhattan and Fort Hays have shown that plowing five or six inches deep produces a considerably better yield than shallow plowing or disking alone, but they also show that the plowing should be completed by the middle of August. This serves to indicate that the type of plowing that is needed for the fly is also best for securing the largest yield of wheat when no fly is present.

3. *Destruction of Volunteer Wheat.* — All volunteer wheat should be kept down from the preparation of the seed-bed until the crop is sown, in order that it may not serve to carry the fly over to the main crop.

4. *Late Sowing.* — Sow the wheat at such a time as will enable it to get above the ground after the majority of the flies have emerged and deposited their eggs. The date for any one year in any locality can be determined by any one who has studied the fly enough to be able to follow its changes. It has not been practicable in the past to pursue this method, and trial sowings have been resorted to to find the date. Experimental sowings in 1907 at Marysville, Manhattan, Sedgwick, and Caldwell, and in 1908 at Norton, Wilson, Great Bend, Sawyer, Caldwell, Wellington, Sedgwick, Manhattan and Marysville indicate that wheat sown in the northern one-third of the State after September 30,

in the central one-third after October 7, and in the southern one-third after October 15 will be completely free from the fall brood of Hessian fly and relatively free for the entire period of its growth. The date when wheat may be sown to produce the largest yield has not been worked out for all parts of the State, but is probably later than is usually thought. Professor Ten Eyck finds at Manhattan that, other things being equal, the maximum crop for five years has been produced by wheat sown about the 5th of October. Wheat put in the ground two days later or possibly on that date at Manhattan would be completely free from the fall brood of fly. This seems to indicate that the late sowing necessary to avoid the fly may not prove a serious obstacle to securing a maximum yield.

How to control the greater wheat straw-worm

This insect remains in the stubble and straw, and possibly like its relative, the joint-worm, to some extent in the grass along the fences from harvest time until the following March. If stubble, straw and grass along the fences be destroyed, say, by fire, at any time before the middle of the following February, the new crop of wheat will be practically free from the greater wheat straw-worm and also the joint-worm, which is so frequently found with it.

How to control the Hessian fly and greater wheat straw-worm.

Add to the measures for combating the fly the destruction of the straw and the grass along the fences.

Approved:

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MANHATTAN, KAN., June 18, 1909.

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