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Agricultural Experiment Station
Kansas State Agricultural College

Hessian Fly.

During the past year Kansas wheat has suffered great damage from Hessian fly. Some estimates place the total loss at slightly more than ten per cent of the estimated crop, as based upon the acreage sown. The attack has been most severe in central and southern Kansas, but, with the exception of the extreme north and the extreme west, the fly has attracted attention throughout the wheat belt.

When we realize that the habits of this insect are such that the use of proper cultural methods at the right time will largely prevent it from causing noticeable damage, it is plain that information of this sort should be in the hands of every man who has recently suffered from its ravages.

HABITS AND LIFE HISTORY.

Where the Fly is Now. — Just now the flies may be found as small, brown, long-oval, seed-like objects about one-fifth of an inch long, lying between the sheath and the straw just above the joint, where the straw breaks over, or they may be found packed in with many of their fellows about wheat heads which never emerged from their sheaths.

Indications of its Work. — At this time perhaps the most characteristic evidence of fly appears in the broken-down wheat straws. These stalks are usually broken rather close to the ground.

What it will do This Summer, Fall, and Winter. — With a few exceptions the fly will remain as a quiet, brown flaxseed until next September and October, then the long-legged gnat-like adults will emerge and lay their long-oval reddish eggs lengthwise in the grooves on the upper sides of the leaves of the volunteer or early-sown wheat plants. These eggs, which are just large enough to be seen with the unaided eye, soon give forth tiny reddish larvae that wriggle down inside the leaf-sheath until they reach the joint. Here they rasp the tissues of the stem, feed, and grow.

It is usually the central stalk that is worst infested, while the tillers, many of which grow up after the flies have deposited their eggs, will be almost or entirely free. The maggots soon lose their reddish color and turn white, the majority reaching maturity and transforming into brown flaxseeds before cold weather. Thus they pass the winter, safely tucked in between the sheath and the main stem just above the joint, and usually below the surface of the ground.

Indication of Fall Work. — In the late fall the presence of the fly is indicated by the form of the plant. The stalk infested with maggots has no strong central shoot, but appears leafy and bushy. The first effect of the fly is to make the wheat tiller freely, covering the ground and giving the field a deep green color, thereby deceiving the inexperienced into thinking the prospect for wheat unusually fine. Later, if enough flies be present, the deep green will be exchanged for a sickly yellow appearance, and it is then evident to every one that something is wrong.

What it will do Next Spring and Summer. — With the coming of spring the long-legged, gnat-like flies will crawl out of the flaxseeds and fly about over the wheat depositing eggs on the blades. (In the spring of 1908 the flies came forth in March and collected in some wheat fields in sufficient numbers to redden the soil.) From the eggs laid at this time will come the maggots

that feed on the wheat, weakening the stems and causing them to break and fall over before harvest. Some of these maggots will reach maturity and transform into flaxseeds, from which will come adult flies in May. These flies will deposit eggs on the blades of the most immature stalks and the larvae develop about the heads, so sapping them that they may never emerge from their sheaths. It is probable that the bulk of damage to the wheat crop is effected by the work of the fall and early spring broods, and that those flies emerging in May do little real damage to the crop, because they appear to confine their attacks to young plants that spring up from the base of older stalks. This habit does, however, increase the numbers of the destructive fall brood.

NATURAL ENEMIES.

Certain tiny wasp-like insects prey on the Hessian fly, and when these are present in large numbers the fly disappears as an injurious insect. Not enough study has been given to these parasites to enable anyone to say under just what conditions they thrive and do their work. They were present and working on the fly during this spring and early summer, at least in the eastern edge of the wheat belt, but the farmer cannot afford to sit back and wait for them to destroy the pest. He must take hold of the matter himself.

METHODS OF COMBATING THE FLY.

Destruction of Flaxseeds in Stubble. — The Hessian fly is now in the flaxseed stage, resting in the stubble just above the joints between the sheath and the stem. The flaxseeds may be found just above any of the joints, appearing from the surface of the ground upward. They can easily be destroyed by burning the stubble over or by disking it just after harvest and plowing it so deeply two to four weeks later that none of the straws or volunteer wheat plants shall be left sticking out to form passageways for the flies when they emerge from the flaxseeds. The latter method has the advantage of increasing the amount of humus.

Destruction of Volunteer Wheat. — All volunteer wheat should be plowed under deeply before the regular crop is sown, so the flies infesting it will be destroyed and not left to attack the main crop.

Trap Crop. — Inasmuch as it has been found that the flies can wait for some time in order to secure a desirable place in which to deposit their eggs, it is often desirable and worth while to sow early a strip of wheat about or across the prospective wheat field, and, before the main crop is sown, to plow this fly-infested wheat under deeply, thus not only inducing the flies to lay their eggs but destroying their progeny.

Late Sowing. — By far the most important measure is to be found in the practice of sowing the wheat only after the bulk of the flies have deposited their eggs. This time, however, varies with the nature of the season from year to year, and can be determined only by experiment. Experimental sowings during the past year have shown that wheat sown after October 15 in southern Kansas, that sown after the first week of October in central Kansas and that sown after September 30 in northern Kansas has been almost entirely free from infestation.

Useful General Practice. — Where the succeeding field of wheat can be sown some distance from that of the previous year, fewer of the insects will be able to reach the grain to deposit eggs. It is obvious that any method that makes a stronger, healthier plant will mature a better crop in spite of the fly than would be possible where plants equally infested are neglected. Therefore, the choice of good seed, enriching the soil and careful preparation of the seed-bed are important measures in reducing the damage due to Hessian fly.

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