

would be fatal to them, to say nothing of the rough handling in lowering, stowing away, and hoisting out again, in loading and unloading. But if carried on deck they would be kept much cooler and would not be subject to so much rough handling; and unless there was a considerable advantage in rates I would prefer the all-rail route. For early shipments procure a well-ventilated car, if possible, which the railway company would furnish on application. Then the question next comes, Who shall we get to buy them, and how will we sell to the best advantage? I would say, begin early in the season before the fruit is ready, and get the addresses of some good, reliable dealers in each of the principal towns, and correspond with them. Then there are commission men who would be glad to handle all consignments. The Niagara Fruit Growers' Co. have an agency in Winnipeg, and propose to open others in the principal towns through the Northwest, so that I think there need be no trouble in selling the fruit, and at a price that would net the grower a fair profit for growing, and for his trouble in picking and packing.

These early apples are grown to greater perfection in Ontario than in any part of America. The Duchess, as grown here, is as near perfection as can be, and is without a rival as a cooking apple. The Astrachan, though good for both dessert and cooking, is not a satisfactory apple to handle, as it does not ripen evenly. It would require picking every few days, as part of the fruit will be ripe, ready to drop, while the rest will be green and hard and unfit to ship, while the Duchess are nearly all ready to pick at once.

The fall apples also grow to great perfection in point of quality, most of them being equally valuable for cooking and dessert purposes. This being the case, it is a pity that any should go to waste, when a market may be found in our own country which a little enterprise and co-operation on the part of the farmers would render available; and it is with a sense of the importance of this matter—the addition to the farmer's income which would come from this source (a matter not to be despised where every little counts)—that I am led to take up this subject and throw out a few hints, with the earnest hope that they may be a help to some of the readers of this journal.

In horticultural matters we are apt to write about cultivation, varieties, soil, etc.—everything that pertains to producing the fruit; while we leave untouched the most important point, viz., what to do with it after we have produced it; or, in other words, how and where shall we market our fruit products to the best advantage? We have the soil and climate for producing the very best fruit in many lines. Our apples, especially, are second to none in the world; and if we fail to make this branch of agricultural industry a source of profit, it will be largely our own fault.

No doubt the exhibit to be made by Ontario at Chicago will do much to open the eyes of, not only the Americans, but of the world to the capabilities of Ontario as a fruit-producing country. The management of the exhibit is in able hands, and will, no doubt, be a credit to the province. But the commissioner, able and experienced though he be, cannot alone make it a success. He must have the hearty co-operation of all the fruit-growers throughout the province, so that he will be able to place on exhibition the very best the country can produce, and there is no doubt that this exhibit will give a great impetus to the fruit-growing industry in this province.

Premiums by Associations.

It was decided at the last executive meeting of the Dominion Sheep Breeders' Association that two premiums of \$10 and \$5 would be offered for essays to be read at the next annual meeting. The subject since chosen was:—"How should the general farmer breed and handle his sheep to realize the greatest profit." The writer is expected to treat fully on breeding, housing, feeding and marketing. Essays to be read at Guelph during Fat Stock Show.

The same amounts are offered by the Swine Breeders' Association. The subject chosen was:—"The most profitable food for swine, and the best mode of preparing it." Essays to be read at Guelph during Fat Stock Show.

Entomology.

Injurious Insects—No. 8.

BY JAMES FLETCHER, DOMINION ENTOMOLOGIST,
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THE HESSIAN FLY.

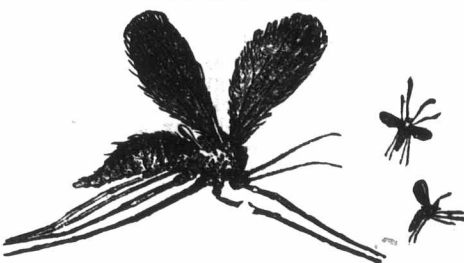


Fig. 1.—The Hessian Fly (Natural size, and much enlarged).

I have endeavored, as much as possible in these articles, to treat of the most important injuries by insects to crops a short time before the attacks occur, so that the readers of the FARMER'S ADVOCATE might know of the best remedy at the right time and be reminded to apply it. The present article, however, is prepared in response to applications for information concerning the "flax-seeds" of Hessian Fly, which had been noticed in wheat screenings.

The insect figured above is sometimes the cause of great injury to wheat and barley crops, and farmers will do well to be always on the alert to detect it whenever present, and take steps as soon as possible to eradicate it. The life-history of the Hessian Fly is briefly as follows:—The perfect insect, a very small and delicate black gnat, appears in the spring and autumn, the exact time varying in different localities; but it is usually in the months of April and May in the spring, and August and September in the autumn. Each female lays about twenty eggs in the crease of a leaf of a young wheat plant. These hatch in a few days, and the young maggots work their way down into the sheathing base of the leaf and remain between it and the stem (Fig. 2), causing the

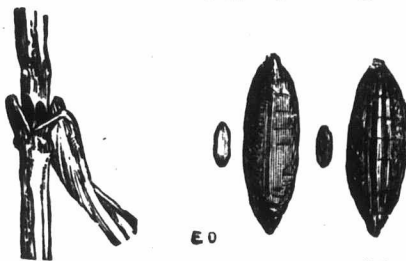


Fig. 2.—"Flax-seeds" of summer attack on barley stem.

latter to swell and become weak by feeding on its juices. As the head becomes filled with grain and heavy, the stem breaks off at the weakened spot before the grain is ripe. The spring brood from eggs laid in April and May comes to maturity and a large proportion of the flies appear in August and September, although some of them may not emerge until the following spring. The brood of flies which comes out in August and September lays eggs upon "volunteer" wheat, young fall wheat and perhaps some grasses. When the young maggots hatch they at once work their way down to the very bases of the leaves and lie at the root of the growing wheat-plant, where they suck out its juices and cause the shoots to

become distorted and abortive. They become full grown before winter sets in, and pass the winter either in the state of white maggots or in the "flax-seed" state (Fig. 3), in which they may be found on removing the lower leaves as little, brown, oval and pointed bodies, somewhat resembling the seeds of flax. Inside these flax seeds the larvæ remain unchanged till the following spring. On the return of warm weather they change to chrysalids, and the perfect flies appear in April, May and June.

The Hessian Fly is not much complained of by farmers in Canada at the present time, but I believe that a great deal more injury is done by it than is recognized to be the case. There is a general impression that infested plants turn yellow in the autumn, but Prof. Webster, of Ohio, has shown that this is not a good indication, but that, on the other hand, infested wheat does not turn yellow in the fall—that the leaves are darker in color than those of a healthy plant and proportionately broader, the slender, spindle-shaped leaf is missing, and the whole plant is merely a bunch of rank-growing leaves. The same authority says: "I am confident that 50 per cent. of what is known here as winter-killed grain is due to the attack of the fly. Wheat will go into winter looking thrifty and even rank, though seriously infested. But for the most part this is killed before spring."

My object in treating of the Hessian Fly at this season of the year is to draw particular attention to this fact, and suggest the advisability of examining fall wheat now to find if it is infested, so that steps may be taken in the spring to strengthen the injured plants by the application of special fertilizers. I would also draw the attention of all who have not yet threshed their wheat to remedy 1 given below, which I believe to be of great importance, not only for this insect, but also as the best means of checking the increase of the other great enemy of wheat, the Wheat Midge, generally known in Canada by the inaccurate name of "Weevil."

REMEDIES.

1. *Burning refuse.*—Of very great importance is the burning of all rubbish and screenings from the threshing mill, wherever barley or wheat have been known to be infested. A proportion, sometimes large, of the flax seeds is carried with the grain, and in the threshing they fall among the rubbish and broken straw beneath the machine. This should always be burnt. Its value, even as chicken feed, is very little, and it always contains enormous quantities of weed seeds which are not eaten by fowls, as well as many of the puparia of the Wheat Midge and Hessian Fly. The burning of all refuse and rubbish on a farm is a most advantageous practice. When a crop is harvested, the refuse should be destroyed as soon as possible, and many of the insect enemies will be destroyed with it; besides this, many injurious insects pass the winter beneath litter and rubbish, and when these are left about they are attracted to a farm where otherwise they might not occur.

2. *Late sowing.*—The best remedy for the Hessian Fly, which is also applicable to the Wheat-stem Maggot (*Meromyza Americana*), is the postponement of sowing fall wheat until after the third week in September, so that the young wheat plants do not appear above the ground until after the flies have vanished.

3. *Treatment of stubbles.*—Harrow the stubble directly the crop is carried, so as to start a volunteer crop for the flies to lay their eggs upon; then plough under early in September, when all the maggots will be destroyed. Another adaptation of this method is in the sowing in August of a strip of wheat, which will attract the females to lay their eggs, and which must afterwards be ploughed under. The burning of stubbles, when it can be safely done in summer, is a good practice, the "flax-seeds" being situated, as a rule, in the first or second joint of the stem. For that purpose the stubble should be left rather long.

4. *Rotation of crops.*—Neither wheat, barley nor rye should be sown again the next season in fields where the crop has been infested this year.

Fig. 3.—Puparia or "flax-seeds" of Hessian Fly.