

heads ; in any case not further attacking the grain, although the latter might remain unthrashed until winter. But since I came to Indiana I have not only reared the adults from volunteer wheat until in November, but have found the larvæ on and about young wheat plants growing in a field sown among growing corn. Furthermore it is known that the insect affects the seeds of grasses also." In the report of the United States Entomologist for the year 1885, p. 319, Prof. Webster records having observed the adult flies from 20th May right through the season up to September. It would appear then that there are sometimes two broods in the season, the second brood subsisting on volunteer wheat.

*Remedies.*—Under this heading I would first of all draw attention to the careless practice of farmers in not destroying the dust and rubbish from the threshing machine, when they know their crop to have been infested with this insect. I have over and over again seen the ground beneath the machine coloured quite perceptibly by the pupæ which have remained in the ears when the crop was carried.

The greater part of these pupæ, although apparently much dried up, are yet in a condition to mature if left undisturbed on the ground. I would strongly recommend that the wise precaution taken by Nova Scotian farmers should be more widely adopted. Col. Blair, of Truro, N. S., tells me that "it is the usual custom in Nova Scotia for good farmers to gather up all the rubbish from the threshing machines, and take it out on to a cross road or other hard ground and burn it. This is a means not only of destroying the larvæ of the "Weevil" and other insects, but also the seeds of pernicious weeds."

Although so well known from its injuries, it would appear from late developments that after all the life-history is not yet thoroughly understood. It is to be hoped that now this is recognized, efforts will be made to fill up the missing links, and perhaps in this way a more practicable remedy may be devised than has yet been discovered, for that portion of the summer brood which hibernates in the ground. Deep ploughing directly the crop is cut has been advocated, and would probably be attended with good results, especially where the field can be left untouched until after the time that the perfect Midges mature the next year. Another method which should receive more attention is the cultivation of such varieties of wheat as are found to be least attacked. Most of these, however, partaking much of the character of the variety known as "goose wheat," are of poor quality; but it is within the bounds of possibility that by careful hybridizing, the quality might be improved without at the same time rendering them susceptible to the attacks of the Midge. Amongst the better varieties almost free from the attacks of this insect, the fall wheat known as the Democrat is one of the most highly esteemed.

For many years the Midge has been so bad in the Province of Nova Scotia that in some districts no efforts are made to grow wheat. Mr. James Clark, writing from Tatamagouche, N. S., writes concerning one variety of wheat which is not attacked: "It is five years since I began to grow 'Midge-proof wheat,' and in that time it has given me the best satisfaction of any variety I ever had, having never been infested with either Midge or rust, both of which are very common here. It gives very fair returns. I have had as high as 20 to 1. The only objection I have to it is that it is rather coarse-grained, and if it could be improved a little in that way would be a great benefit to the farmers. I do not know of any other variety that is altogether Midge and rust proof."

#### The Wheat-Stem Maggot. "Wheat bulb-worm" (*Meromyza Americana*, Fitch.)

*Attack.*—Some time before the wheat should be ripe the ear and top portion of the stem turn white. Upon examination the stem will be found to be severed just above the top joint by a transparent green maggot.

There are probably three broods of this insect in a season. The egg is laid on the young plants of fall-wheat in the autumn, and the maggots work their way down the centre of the stem to the base where they lie all the winter, and turn to pupæ the