

the clods by day (page 23). Fallow land can be kept unattractive to all cutworm moths by destroying all green growth on it from the last half of August to the end of October.

The destruction of larvæ by poison can be accomplished with comparative ease. This is done most economically by the use of a poisoned bait applied to specially prepared furrows. In wet seasons vertical-sided furrows can be used (page 25), but often these cannot be employed, since the soil is usually too dry for their construction without expensive hand labour. Under such circumstances they can be replaced with dusty-sided furrows (page 25). The furrows are made around clean fields which are to be protected. If the fields are already infested, supplementary furrows may have to be made through them (page 28). Two classes of bait may be used as carriers of the poison. They are shorts sweetened with molasses (page 26), and green vegetation. For the latter the best results have been obtained with stinkweed, or alfalfa (page 27).

A method of destroying the larvæ by the use of irrigation ditches has been evolved in Montana. This might be used where water is available during an army cutworm outbreak (page 29).

INTRODUCTION.

The spring of 1915 was marked, in southern Alberta, by an outbreak of a cutworm which was almost unknown, previously, as a species of economic importance in Canada. This cutworm is the larva of the noctuid moth *Euxoa (Chorizagrotis) auxiliaris* Grote.

Three fairly well-defined varieties of this moth have been described as three distinct species. These are *E. auxiliaris* (s.s.) Grote, *E. introferens* Grote, and *E. agrestis* Grote. Observers who have studied long series of these moths have doubted the validity of these species, and Mr. F. H. Wolley Dod now tells me that breeding experiments conducted by himself and Mr. W. H. T. Tams leave little doubt as to the specific identity of the three varieties.

The species is a native of North America. It occurs most abundantly on the western prairies, though it extends as far east as central Manitoba, while a specimen of the moth has been taken in Mexico. It has never, however, been recorded as a pest of much economic importance at a distance of more than a hundred miles east of the Rocky mountains.

This cutworm appeared, for the first time, in the literature of economic entomology in 1898, when Wilcox described a serious outbreak of the larvæ in the Missoula and Bitter Root valleys of Montana. He proposed for it the popular name of an *Army Cutworm*, on account of the migratory habits assumed by it being similar to those of the true Army-worm (*Cirphis unipuncta*).

From that date to the present the reports of the Montana State Entomologist have recorded local outbreaks on various occasions, culminating with an account of an "almost statewide" outbreak in the spring of 1915.

At this latter date the larvæ appeared for the first time in sufficient numbers to constitute a menace to the grain and other crops of southern Alberta. Inquiries regarding them were received from farmers in a district of about 3,000 square miles in extent. Infestations were particularly heavy in the Raymond and the Bow Island districts.

On one previous occasion only had the larvæ been sufficiently abundant in Canada for this insect to be regarded as one of economic importance. In 1903, Fletcher recorded it as injurious to gardens in Calgary and Regina. In the same year, Gillette reported an outbreak in Colorado, though on this occasion there is no record of their attracting attention in Montana.

The references cited above comprise all that has been written on the biology of the species. In these accounts there is no record of the larvæ being present in destructive numbers for two years in succession. It is highly improbable,