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THE ASPARAGUS MINER.

BY

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In Charge of Truck Crop and Stored Product Insect Investigations.

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United States Department of Agriculture,

BUREAU OF ENTOMOLOGY.

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THE ASPARAGUS MINER.^a*(Agromyza simplex* Loew.)

By F. H. CHITTENDEN, Sc. D.,

In Charge of Truck Crop and Stored Product Insect Investigations.

The stalks of asparagus are frequently attacked by insects, and in recent years have been reported considerably injured by the larva or maggot of a minute black fly to which the name asparagus miner has been given. The larva mines beneath the epidermis of the stalk, and when it has transformed to the puparium or "flaxseed" stage the thin outer skin becomes more or less ruptured and the presence of the insect is easily detected. It operates more abundantly near the base

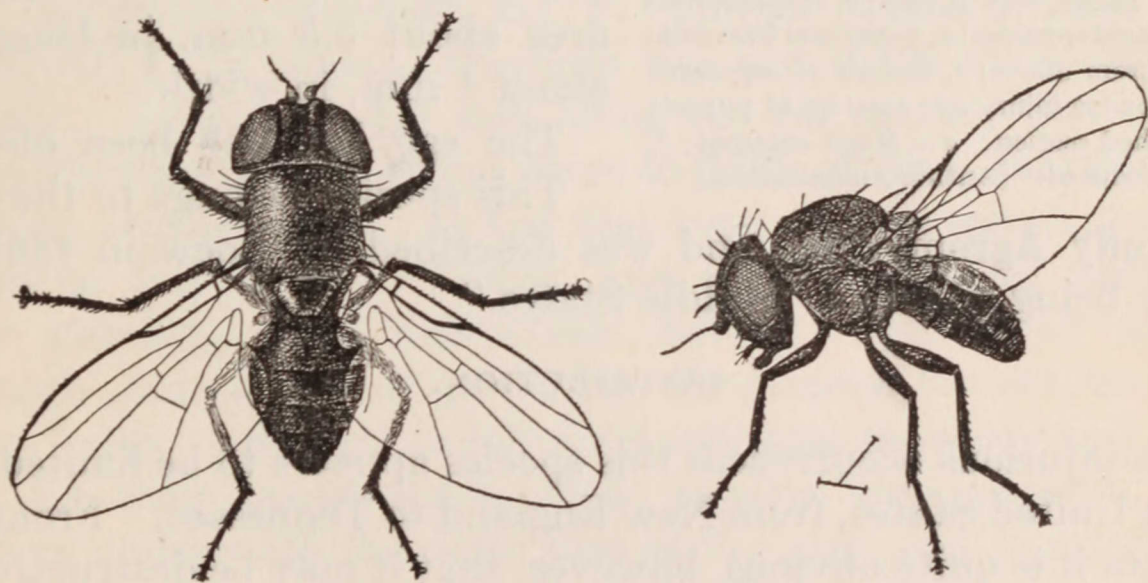


FIG. 1.—The asparagus miner (*Agromyza simplex*): Fly, dorsal view at left, lateral view at right. Highly magnified. (Author's illustration.)

of the stalks and penetrates below the surface of the ground to a depth of 7 or 8 inches. During the year 1906 this species attracted considerable attention by its abundance in some of the principal asparagus-growing sections of New England and it bids fair to become a pest of considerable importance. It was first noticed on asparagus in 1896, prior to which time nothing was known of its habits. It is a native species and evidently restricted to asparagus as a food plant. Until the year 1906 it had not been recognized as doing injury to cutting beds, although attack had been observed in various sections.

^a Revised reprint from Bul. 66, n. s., Bur. Ent., U. S. Dept. Agr.

The mines of the larvæ about and below the bases of the stalks are frequently so abundant that they have the effect of girdling, so that the injured stalks can readily be pulled from the ground.

DESCRIPTIVE.

The parent insect is a two-winged fly (fig. 1), metallic black, with large prominent head and eyes, and clear wings, the wing expanse being about one-sixth of an inch (4 mm.).

The larva (fig. 2, *a*) is about one-fifth of an inch long and milk-white in color. Like other maggots, it is footless, large at the posterior extremity, and tapering toward the head.

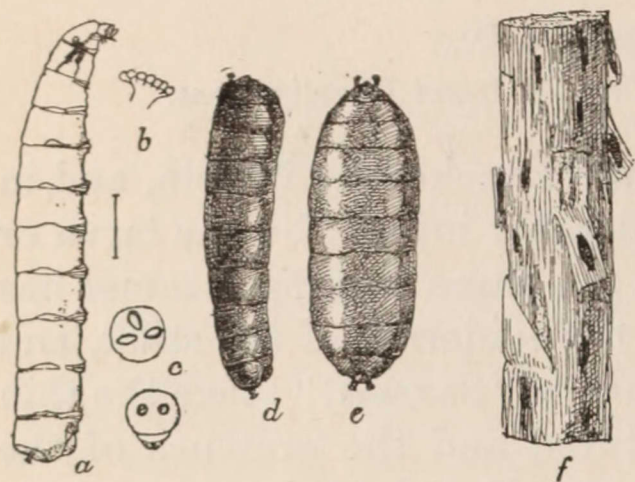


FIG. 2.—The asparagus miner (*Agromyza simplex*): *a*, Larva, lateral view; *b*, thoracic spiracles; *c*, anal spiracles; *d*, puparium from side; *e*, same from above; *f*, section of asparagus stalk, showing injury and location of puparia on detached section. *a-e*, Much enlarged; *f*, slightly reduced. (Author's illustration.)

The puparium (fig. 2, *d*, *e*) is not unlike the "flaxseed" of the pernicious Hessian fly, with which it has been aptly compared. At a little distance, also, it suggests a *Lecanium* scale. This stage is remarkable because of its peculiar flattened and curved position, as seen from the side. It is red in color, and measures about 3.5 mm. in length and about 1 mm. in width.

The egg has not been observed.

This species belongs to the dipterous family *Agromyzidæ*, and was described by Loew in 1861,^a the locality being given as "Middle States."

DISTRIBUTION.

In its injurious occurrences this species appears to be limited to the eastern United States, from New England to Tennessee. From available data it is quite obvious, however, that it may be destructive over a considerable territory, including a large portion of Massachusetts and Connecticut, Long Island, the District of Columbia, Pennsylvania, and Tennessee. As it is recorded from New Jersey, it is probably injurious there, although no reports of injury in that State have reached this office. In time it will doubtless attract attention in intermediate points and in States farther north and west. It has also appeared in asparagus beds in California.

HISTORICAL AND BIOLOGICAL NOTES.

In May, 1897, and afterwards this fly was observed in abundance by the writer on terminal shoots of asparagus, particularly at Cabin John, Md. Two weeks later no more flies were seen, but June 26

^a *Diptera Americæ septentrionalis indigena*, Centuria octava 84, p. 160.

they reappeared and were then usually seen *in copula*. It was surmised at the time that this second appearance indicated the first new generation of the year and its abundance on asparagus seemed to show that it lived in some manner at the expense of that plant. Examination of asparagus plants at that time, however, failed to show attack.^a

In 1900 complaints of injuries were made in the District of Columbia, and at Knoxville, Tenn., and in the meantime the species came under the observation of Mr. F. A. Sirrine, who stated^b that work was first observed in asparagus fields on Long Island in 1896. Late in September, 1900, word was received of injury to asparagus from Tennallytown, D. C. When the writer visited the field, although injury was apparent on the outer skin of some stalks, no living specimens could be obtained, only the dried puparia being in evidence at that time. October 2 of the same year, Mr. Samuel M. Bain, University of Tennessee, Knoxville, Tenn., sent a stalk of asparagus showing the work of this miner upon the skin, and, October 27, specimens of the dried puparia.

February 18, 1901, it was reported at Philadelphia, Pa., that this insect seemed to cause much greater trouble than the common asparagus beetle. Two or three new beds of asparagus were lost on account of its ravages.

By the writer's direction, Mr. F. C. Pratt visited a truck farm at Brookland, D. C., where asparagus was one of the main crops, June 18, 1902. Asparagus was still being cut for market, but volunteer plants were growing here and there in fields of corn, cantaloupe, and potatoes, between rows. A few flies were seen on terminal shoots of asparagus that showed wilting, and many volunteer plants were badly infested, most individuals having transformed to pupæ. Although stems break off just below the ground, the entire colony of insects below that point is left with sufficient moisture and nourishment for their maintenance. The puparia were present in great numbers underneath the outer skin of the root, and as many as nine puparia were counted in a space only an inch long on one stalk. The stalks below the point of injury appeared to be perfectly sound. Larvæ also were found in rotting stalks that broke off just below ground.

During September, 1906, Messrs. J. B. Norton and A. D. Shamel, of the Bureau of Plant Industry, furnished stems of asparagus from Concord, Mass., showing severe infestation by this species, many puparia being present under the mined outer skin. In the neighborhood of Concord, a very important asparagus-growing region where hundreds of acres are devoted to this crop, infestation was practically absolute, the insect being as abundant as the common asparagus

^a Bul. 10, n. s., Div. Ent., U. S. Dept. Agric., p. 62, 1898.

^b Bul. 189, N. Y. Agric. Exp. Sta., p. 277, Geneva, 1900.

beetle, and present wherever rust was found, as also where no rust was present. Some plants showed injury 7 inches below the surface.

Later Mr. Shamel reported finding infestation in every field and patch of asparagus which he visited in Massachusetts and Connecticut, particularly at Suffield, Granby, and Hartford, Conn., and he believed attack to be widespread.^a

October 26, 1906, Mr. Ralph E. Smith wrote that the conditions under which this asparagus miner was found in abundance in the yellow stalks of asparagus in California, as reported by him in an article on Asparagus Rust Control,^b had prevailed for two or three years. The insect was always very abundant at the base of yellow, dying stalks, although injury was attributed to the "centipede," reported as wireworms on a previous occasion.^c

The asparagus miner was reported by Mr. I. J. Condit in the vicinity of Antioch, Cal., August 19, 1908, where the common asparagus beetle was also abundant. The miner was equally numerous and stalks showing infestation were received. The miner-infested stalks could generally be detected by their roughened appearance near the ground. This species was also taken at Oakley, and it seems probable that it is becoming generally distributed in California. In one place at Oakley Mr. Condit observed the miner quite common on some stalks.

During October, 1908, the writer observed this species well established on asparagus in the vicinity of Portsmouth, Va. In October, also, very severe injury was reported to asparagus in the vicinity of Concord, Mass. The roots of the plants were not only girdled, but the miners worked up the stalks some inches above the ground.

REMEDIAL MEASURES.

With our present knowledge of the life economy of this species, two methods of control suggest themselves as of greatest value, and it may be that they will prove all that is necessary under ordinary conditions.

(1) In spring permit a few volunteer asparagus plants to grow as a trap crop, to lure the fly from the main crop or the cutting beds for the deposition of her eggs. After this has been accomplished the trap crop should be destroyed by pulling the infested plants and burning them with their contained puparia. The time to pull the plants will vary according to locality and somewhat according to season also. The second and third week in June would be about the right time in and near the District of Columbia. On Long Island this work should be done a week or two later. In the northernmost

^a Its occurrence at New Haven, Conn., is recorded by W. E. Britton (6th Rept. State Ent. Conn. for 1906, pp. 303-306, 1907).

^b Bul. 172, Univ. Cal. Agric. Exp. Sta., p. 21.

^c Bul. 165, loc. cit.

range of this insect—for example, in Massachusetts—the last week of June would be a suitable time.

These plants must be destroyed before the end of the cutting season, otherwise they are apt to provide abundant rust infection.

(2) The second generation can be destroyed in like manner by pulling old infested asparagus stalks as soon as attack becomes manifest and promptly burning them also.

If this work were carefully done over a considerable area, it would leave little necessity for other methods, since it would do away with these insects in the vicinity and leave few to be dealt with another season; unless, indeed, this insect has an alternate food plant. Thoroughness and the cooperation of neighboring asparagus growers are essential for success.

Approved:

JAMES WILSON,

Secretary of Agriculture.

WASHINGTON, D. C., *January 31, 1911.*

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