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NEW HAMPSHIRE COLLEGE

AGRICULTURAL EXPERIMENT STATION

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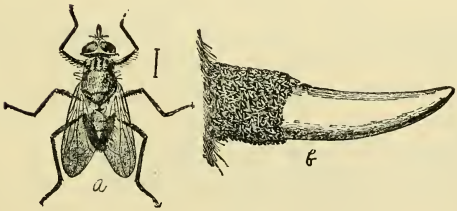
BY CLARENCE M. WEED



NEW HAMPSHIRE COLLEGE
OF
AGRICULTURE AND THE MECHANIC ARTS
DURHAM, N. H.

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The Bulletins of this Station are sent to any resident of New Hampshire upon application.

REMEDIES FOR THE HORN FLY

BY CLARENCE M. WEED

About eight years ago there appeared in some of the Eastern States a fly which attacked cattle in a manner differing somewhat from that of the common cattle pests. Its most peculiar habit was that of congregating upon the base of the horn in clusters as shown in the right hand figure on the front page of this bulletin. On this account the insect became commonly known as the Horn Fly, although it has since been found that, as a rule, it thus clusters upon the horn only when very abundant. It may be present in annoying numbers without showing this habit.

After its introduction into New Jersey, where it was first noticed in 1887, the Horn Fly spread rapidly in all directions. In a few years it had covered, practically, the greater portion of the United States and Canada. It has been present in New England for several years, and has been sufficiently abundant to cause considerable annoyance in New Hampshire for at least three seasons. The present summer it appears to be more abundant than ever.

The Horn Fly is a small, two-winged, six-legged, grayish-black fly about one-fifth of an inch long. As compared with the common house-fly it is much smaller; and is a little smaller, darker, and longer in proportion to its width than the common cattle fly. The legs are long, and the large compound eyes are prominent, covering much of the head. In front of and between the eyes project the two two-jointed "feelers" or antennæ, and projecting from the lower side is the proboscis or organ through which the blood of the victim is sucked. The posterior part of the body, called the abdomen, is small and covered with hairs.

These flies light upon various parts of the cow's body—especially over the shoulders out of reach of the tail—work their

way down through the hairs until they can insert their beaks into the skin; apparently they then inject a little poisonous secretion which causes irritation and inflammation and a flow of blood to the spot. This blood is then sucked into the stomach of the fly. When once established they remain for some time; and commonly come into the barn at milking time still in position on the cows. Cattle thus attacked become restless and irritable and if the flies are very numerous, they lose flesh and give less milk.

The life-history of the Horn Fly may be briefly summarized as follows: The female flies deposit the small, whitish eggs (Fig. 2, *a*) in freshly dropped cow dung. Within a day these eggs hatch into little whitish maggots or larvæ, that become full grown in a week or ten days. They are then three-eigths of an inch long, and of the form shown at *b*, Fig. 2. These full-grown larvæ change to the third stage of insect existence—that of the chrysalis or pupa—at or just below the surface of the ground. They are then brown in color and of the shape shown in *c*. A few days later a fully developed Horn Fly emerges from each of these brown cases, and thus completes the round of the insect's life history.

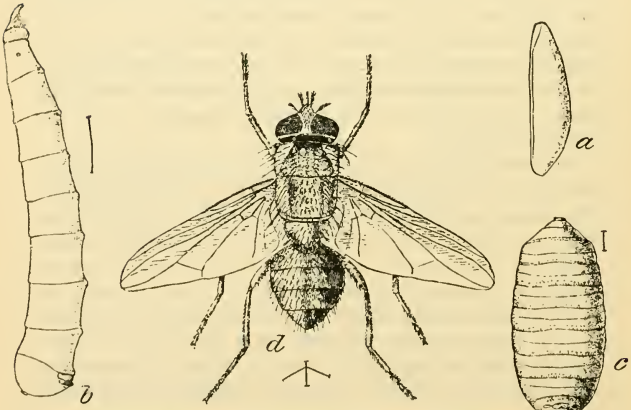

Fig. 2—The Horn-fly: *a*, egg; *b*, larva; *c*, puparium; *d*, adult in biting position. Magnified.

The most satisfactory way of preventing the attacks of the Horn Fly is to apply to the cattle some substance that serves as a repellant. We have experimented with a number of materials, and find that the best results are obtained by the use of a cheap oil—such as fish oil or crude cotton seed oil—to which a small amount of carbolic acid or pine tar has been added. Applied rather lightly to the cattle by means of a wide paint brush, a sponge, or even a woolen cloth, such a combination immediately drives off the flies and remains on in condition to keep them off for about five days. This is a very simple and effective remedy; it should be applied whenever the flies become troublesome, unless the emulsion described below is used.

Either of the following formulas are recommended for this purpose:

I.

Crude Cotton Seed Oil, or Fish Oil,.....3 parts.
Pine Tar,... ... .1 part.

II.

Crude Cotton Seed Oil, or Fish Oil,.....100 parts.
Crude Carbolic Acid,.....3 parts.

In either case these substances are to be mixed and applied as described above.

We also experimented with a combination of kerosene emulsion and tobacco decoction. The emulsion was prepared by adding two gallons of kerosene to one gallon of a solution made by dissolving one-half pound of hard soap in one gallon of boiling water, and churning the mixture by forcing it back into the same vessel through a force-pump with a rather small nozzle until the whole formed a creamy mass, which will thicken into a jelly-like substance on cooling. The soap solution should be hot when the kerosene is added, but of course must not be near a fire. The emulsion thus made was diluted before using with nine parts of water to one part of emulsion. There was then added one gallon of a decoction made by boiling one pound of strong tobacco in a gallon of water. This was sprayed upon the cattle by means of a force-pump and a spray nozzle. Wherever the liquid came in contact with the flies it killed them instantly, and it remained on in condition to

act as a repellant for two or three days. In this respect it was not so satisfactory as the oily combination, although the cattle to which it was applied were cleaner and less greasy. By spraying with this combination three times a week the cattle can be kept free from the Horn Fly with very little trouble, and at small expense.

The accompanying figures were first published in *Insect Life*, issued by the U. S. Department of Agriculture. I desire also to acknowledge my obligations to Mr. E. M. Pike for coöperation in conducting the experiments here reported.

Refuse tobacco stems are to be used in making the decoction described above. We purchased from Weeks & Potter, wholesale druggists, Boston, crude cotton seed oil for 65 cents a gallon; crude carbolic acid for 50 cents a gallon and pine tar for 37 cents a gallon. Fish oil is quoted at $1.10 a gallon.