

Sheep Bot Fly Biology & Management

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Introduction

The larva of the sheep bot fly, *Oestrus ovis* L., is a parasite that lives on mucous surfaces of the nasal passages and sinuses of sheep and goats. It has been estimated that sheep bot fly larvae cause a 4 percent decrease in weight gain. Drummond in 1981 estimated annual losses in sheep production in the United States due to sheep bot fly to be \$13.5 million. An external sign of infestation is the appearance of a slightly to moderate runny nose (Figure 1); this condition increases in severity as the infestation develops.



Figure 1. An external sign of sheep bot fly infestation is the appearance of a runny nose.

Sheep Bot Fly Biology

Adult Oviposition Behavior

The adult sheep bot fly, which has a bee-like appearance, is 10 to 12 millimeters (approximately 3/8 to 1/2 inch) in length (Figure 2). Adults do not feed and the females do not lay eggs directly on the host. Instead, fertile eggs hatch within the female fly, and she deposits newly hatched larvae in the nostrils of the host. Sheep react to the larva-laying attempts of the flies by running or walking with their noses close to the ground or huddling in groups.



Figure 2 – The adult stage of the sheep bot fly is shown.

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Figure 3 – These are the larval instars of the sheep bot fly. The third instar is at the top of the photograph, followed clockwise by the first and second instars.



Figure 4 – A cross section through a sheep skull exposes a third instar in one of the sinuses.

Larval Life History

Like other flies, the sheep bot fly has four stages: egg, larva, pupa, and adult. Because the egg stage hatches within the female fly, it is not seen. Larvae pass through three stages or instars of increasing size (Figure 3). The stages are seldom seen because they develop exclusively within the nasal passage and sinuses of the host.

The first instar, which is only a little more than a millimeter (approximately 1/32 inch) in length, is found on the mucosa lining of the nasal passages. As this stage moves from the nasal passages toward the openings of the

sinuses, it molts to the second instar. The third stage (Figure 4) grows within the sinuses up to 20 millimeters (approximately 3/4 inch) in length until it is ready to leave the host. Fully developed larvae leave the sinuses and nasal passage, drop to the ground, and pupate in the soil.

The timing of the sheep bot fly life cycle is dependent upon climate. In southern areas of the United States where winters are moderate, adult flies are active during all but the very coldest months, and larvae continue to develop within the host during winter. In northern areas, adult flies are active only during the summer and early fall. In late fall and winter, first instar larvae are either in a suspended state of development or are growing slowly. In the warm days of summer, larval development time may require only 25 to 35 days. Larvae that overwinter, however, may require up to 10 months to complete their development. The duration of the pupal stage varies between one and two months depending on weather conditions.

Sheep Bot Fly Management

From 1983 to 1987, more than 400 slaughtered sheep were examined at the University of Wyoming to determine the extent of sheep bot fly infestation in the Rocky Mountain region on sheep originating primarily from Wyoming. A few sheep from Colorado, Idaho, and Nebraska were included in the study. More than 90 percent of the sheep were infested with larvae during 11-month periods (Figure 5).

In Wyoming and neighboring states, adult fly activity is greatest in the summer and fall, and increasing numbers of first instar larvae appear in the nasal passages of sheep at that time of year. Second and third instar larvae begin to increase in abundance in early winter, and their numbers increase steadily until June (Figure 6). The numbers then decline rapidly as larvae leave their hosts to pupate.

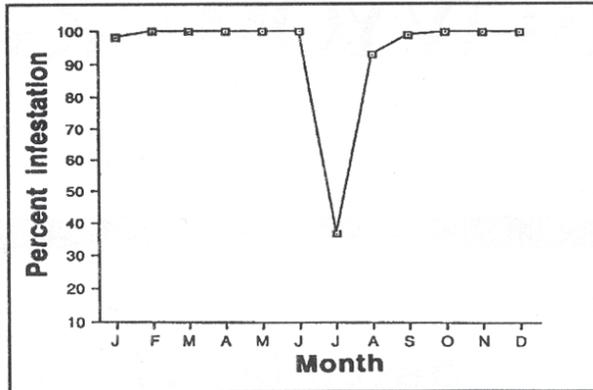


Figure 5 – This shows the seasonal incidence of sheep bot fly larvae in sheep heads from Wyoming and surrounding states during the 1983-1987 time periods.

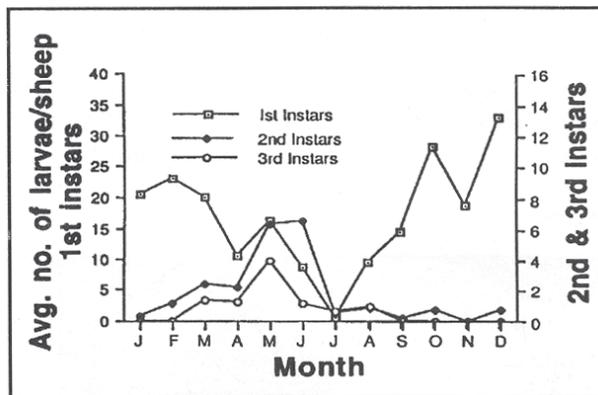


Figure 6 – This shows the seasonal incidence of three larval instars of sheep bot fly found in dissected sheep heads from Wyoming and surrounding states during the 1983-1987 time period.

Management Options

Control of the sheep bot fly is difficult because of the location of the parasite in the host. Currently, the most effective method is the use of an approved parasiticide on the larvae. (See the appendix for specific parasiticides registered for management of the sheep bot fly in the United States.) The favored time for treatment is during late fall or early winters after one or more killing frosts



Figure 7 – Oral drench is being applied to sheep to control sheep bot fly.

have eliminated the adult flies. At that time larvae harbored by sheep are predominately first instars and are found mostly on the nasal mucous membranes. Based on a study of an isolated range in New Mexico, it would appear that sheep bots can be controlled if all sheep in any given area are treated annually with effective parasiticides.

An oral drench of parasiticide has been shown to be an effective application method (Figure 7). See the label instructions to ensure proper dosage and administration.

Cultural strategies to reduce the impact of this pest have not been developed nor have effective biological controls been identified. Cooperative Extension Service educators or other animal health professionals may have more information about sheep bot fly in particular locations.

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Appendix A

Parasiticide registered for control of sheep bot fly in the United States

Ivomec (ivermectin) Sheep Drench, 0.08 percent solution, is currently registered for control of the sheep bot fly *Oestrus ovis* L. in the United States. It can be used as parasiticide as outlined in this bulletin and must be used according to label instructions. IVOMEc provides effective control of the sheep bot fly. IVOMEc Sheep Drench also provides effective control of gastrointestinal roundworms and lungworms. IVOMEc Sheep Drench may be applied orally with any standard drenching equipment at a dose of 3.0 milliliters per 26 pounds of body weight. Do not treat sheep within 11 days of slaughter. Observe all label precautions.

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