

# Sheep Keds in South Dakota

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## Introduction

Although sometimes referred to as the sheep tick due to their activity and lifecycle, sheep keds, *Melophagus ovinus* (L.) (Diptera: Hippoboscidae), are parasitic flies. Both the male and female sheep keds are blood feeding parasites that can infest sheep and cause direct and indirect health problems (Small 2005). Although sheep keds originated from the Palearctic biogeographical realm, an area that includes Europe, Asia, and North Africa, they are now established in most sheep rearing areas in the world due to human movement of sheep, including South Dakota (Kettle 1984, Kantach and Thompson 1986, Small 2005).

## Lifecycle

Sheep keds have a unique lifecycle compared to other insects. After mating, females produce a single egg that hatches within the uterus (Lenoble and Denlinger 1982). The larva remains in the uterus for 7-12 days while feeding on a secretion from a “milk gland” (Lenoble and Denlinger 1982). Once fully developed, the female deposits the larva and attaches it to the wool (Lenoble and Denlinger 1982). Within 6-12 hours, the larva molts into the pupal stage (Lenoble and Denlinger 1982). Females can produce another larva within 6-8 days of depositing the previous larva and may produce 5-6 offspring over the course of their lifetime (Graham and Taylor 1941, Evans 1950, Piotrowski 1984). The pupal development takes 19-30 days and is greatly affected by ambient temperature (Graham and Taylor 1941, Evans 1950). Longevity of adults varies by sex, with females living 80-130 days and males living approximately 80 days (Nelson 1955).

## Identification

Adult (Kantach and Thompson 1986, Šlapeta 2022)  
(Figure 1):

- Both sexes lack forewings and halteres
- Six legs
- Approximately 7 mm long
- Grayish brown to reddish brown in color with body covered in short bristly hairs
- Abdomen is pear-shaped and wider than thorax and head
- Stout claws at the end of the legs (front claws largest)
- Piercing-sucking mouthpart



Figure 1. Sheep ked adult (*Melophagus ovinus*). Photo courtesy of Ken Gray Photograph Collection, 1964-1979 (P 256), Oregon State University Special Collections and Archives Research Center, Corvallis, Oregon.

Larva (Kantach and Thompson 1986):

- Oval shaped
- White to off white in color
- Approximately 3.175 mm long
- No appendages
- Attached near the base of the sheep's hair with a glue-like substance
- Typically found at the bottom of the sheep's neck, inner legs, and belly

Pupa (Kantach and Thompson 1986) (Figure 2):

- Nearly round in shape
- Dark brown
- Remains in same location where the last stage larva was glued

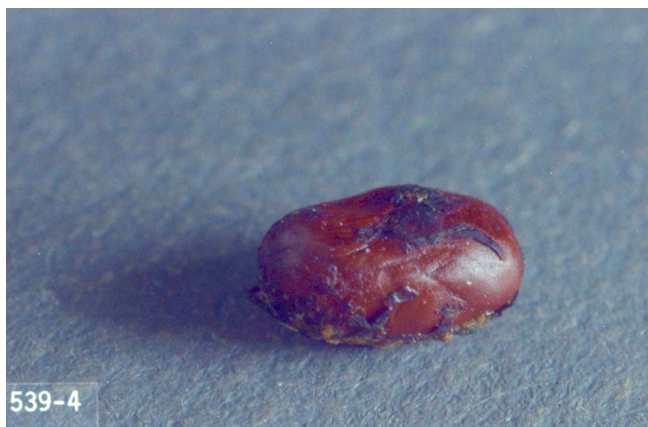


Figure 2. Sheep ked pupa (*Melophagus ovinus*). Photo courtesy of Ken Gray Photograph Collection, 1964-1979 (P 256), Oregon State University Special Collections and Archives Research Center, Corvallis, Oregon.

## Economic Impact and Veterinary Significance

If sheep keds are left unmanaged, they can cause economic losses (Small 2005). For young lambs, sheep ked feeding may result in anemia, causing reduced growth and production (Small 2005). Historical research studies found an approximate 5.5 lb weight differences between treated and untreated lambs, but also noted that diet quality was a contributing factor to lamb weight (Muma et al. 1952, Nelson and Slen 1968). Severe infestations of young lambs can result in increased mortality rates (Kantach and Thompson 1986). Infested sheep will bite, rub, and scratch at sheep ked infested body regions (Small 2005). These activities lead to skin irritation and the development of hard nodules (i.e., cockles), which reduce the quality and value of the

hides (Legg et al. 1991). The sheep's efforts to remove the sheep keds also result in reduced wool quality and quantity due to wool loss (Schwardt and Matthyse 1948). In addition, the excrement of the sheep keds is noted for its ability to stain the fleece, but standard scouring processes removed the stains and previous studies found there were no differences between infested and uninfested wool color (Schwardt and Matthyse 1948, Bosman et al. 1950).

An additional impact is that sheep keds are responsible for the mechanical transmission of the causative agent for blue-tongue disease (Small 2005). Approximately 70% of blue-tongue virus infected sheep die, with survivors experiencing reduced body and wool weight (Mathieson 1991). Blue-tongue virus may cause termination of pregnancies and congenital abnormalities in sheep (Mathieson 1991).

## Management

Sheep ked infestations have been reported to vary based on wool type, with long-wooled open-fleece breeds being more susceptible (Evans 1950, Tetley 1958). For all infested sheep, the sheep ked may be managed through shearing, which removes approximately 70-94% of the pupae and 75-91% of the adults (Evans 1950). Additionally, products labeled for use on sheep and sheep ked management will effectively reduce infestations (Small 2005). There is some evidence that insecticidal management of sheep keds during the fall with pour-on products is less effective than dusting methods (Pfadt 1959). Pour-on, dip and dust products can all effectively reduce sheep ked adults, but these products are likely to have limited to no efficacy on the pupae (Small 2005). For all insecticide products, it is important to read and follow label instructions regarding the use of personal protective equipment (PPE) and application of the product.

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