



Management of External Parasites on Sheep and Goats¹

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Keys to Pesticide Safety

1. Before using any pesticide, stop and read the precautions.
2. Read the label on each pesticide container before each use. Heed all warnings and precautions.
3. Store all pesticides in their original containers away from food or feed.
4. Keep pesticides out of the reach of children, pets and livestock.
5. Apply pesticides only as directed.
6. Dispose of empty containers promptly and safely.

Recommendations in this guide are for guidelines only. The user must insure that the pesticide is applied in strict compliance with label directions.

The Food and Drug Administration has established residue tolerances for certain insecticides in the meat of certain animals. When these and other approved insecticides are applied according to

recommendations, the pests should be effectively controlled and the animals' products will be safe for food.

The improper use of insecticides may result in residue in milk or meat. Such products must not be delivered to processing plants.

To avoid excessive residues, use the insecticides recommended at the time recommended and in the amounts recommended. See Table 1, Table 2, Table 3 and Table 4.

The use of trade names is solely for the purpose of providing specific information. It is not a guarantee or warranty of the products named and does not signify that they are approved to the exclusion of others.

External Parasites of Goats

Arthropod pests limit production in the goat industry in many ways. External parasites feed on body tissue such as blood, skin, and hair. The wounds and skin irritation produced by these parasites result in discomfort and irritation to the animal.

1. This document is ENY-253, one of a series of the Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: May 1995. Revised: May 1999. Please visit the EDIS Website at <http://edis.ifas.ufl.edu>. Additional information on these organisms, including many color photographs, is available at the Entomology and Nematology Department WWW site located at <http://www.ifas.ufl.edu/~entweb/entomolo.htm>.

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Parasites can transmit diseases from sick to healthy animals. They can reduce weight gains and milk production. In general, infested livestock cannot be efficiently managed to realize optimum production levels.

The following external parasites affect Florida dairy goats: biting lice, sucking lice, nose bots, keds, myiasis (blow fly larvae), mites (mange), sticktight fleas, and flies (house and stable).

Lice

Lice are external parasites which spend their entire lives on the goat. Both immature and adult stages suck the blood or feed on the skin of goats. Goat lice are host specific and only attack goats and their close relatives such as sheep.

Lice-infested animals may be recognized by their dull, matted coat or excessive scratching and grooming behavior. Sucking lice pierce the host's skin and draw blood. Biting lice have chewing mouthparts and feed on particles of hair, scab and skin exudations. The irritation from louse-feeding causes animals to rub and scratch, causing raw areas on the skin or loss of hair. Weight loss may occur as a result of nervousness and improper nutrition. Milk production is reduced about 25 percent. Also, the host is often listless and in severe cases the loss of blood to sucking lice can lead to anemia.

Lice are generally transmitted from one animal to another by contact. Transmission from herd to herd is usually accomplished by transportation of infested animals, although some lice may move from place to place by clinging to flies (phoresy). Lice are most often introduced to herds by bringing in infested animals.

Louse populations vary seasonally, depending largely on the condition of the host. Most sucking and biting lice begin to increase in number during the fall and reach peak populations in late winter or early spring. Summer populations are usually minimal, causing no obvious symptoms. Animals under stress will usually support larger louse populations than normally found.

Control of louse infestations is needed whenever an animal scratches and rubs to excess. Louse control is difficult since pesticides do not kill the louse egg. Since eggs of most species will hatch 8 to 12 days after pesticide application, retreatment is necessary 2 weeks after the first pesticide application.

The angora goat biting louse, *Bovicola limbata* and *Holokartikos crassipes* are the two major biting louse species. The goat biting louse and the sheep biting louse are of lesser significance.

All four species live on the skin surface feeding on scales, bits of hair and other skin surface debris. Egg hatch requires 9 to 12 days, and the entire life cycle averages 1 month.

The biting lice of goats are world-wide in distribution with winter-time populations being most severe. In Florida high populations have been seen year round.

The best control of biting lice is an animal residual spray. Retreatment is recommended 2 weeks after the first pesticide application.

Five species of sucking lice attack goats. The following are of importance:

1. African blue louse - found in semi-tropical climates in the United States, India, and Puerto Rico. They are found on the body, head and neck of goats. Heavy populations have caused death of the host.
2. Foot louse - this louse prefers the feet and legs of goats and sheep. Populations peak in the spring and at the time the lice may affect the belly area as well. Scrotum infestations on bucks are common. Lambs seem to have the highest infestations. Egg hatch for this species of louse takes longer than the other species. Therefore retreatment should be applied after 3 weeks.
3. Goat sucking louse - populations are dispersed over the animal's body. It is also found on sheep.

4. The face and body louse and the long-nosed cattle louse - these are minor pests of goats.

Nose Bot Fly

The nose bot fly (Figure 1) infests the nostrils of sheep and goats. In infested animals, there is a discharge from the nostrils, vigorous shaking of the head, loss of appetite and grating of the teeth. In the presence of the fly, the animals are excited, shake their heads, snort and rush with their noses in the dust.

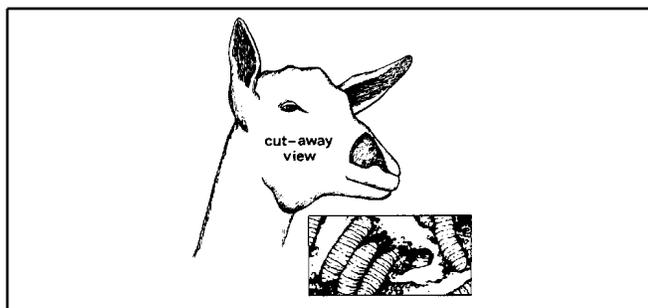


Figure 1 . Nose bot fly.

Nose bot flies are a winter-time problem. Up to 25 bots have been found in the nasal passages of sheep in Florida. They may cause eye damage in man. The larvae of the fly are laid in the nostrils. They migrate up the nasal passages and feed on mucous and mucous membranes. No control is available.

Keds

Keds (Figure 2) (Hippoboscidae), also known as louse flies, are large, flattened, usually wingless parasitic flies. Two species feed on goats, but one reproduces on deer and feeds on goats. Sheep ked bites cause irritation and prompt the infested goats to rub, bite, and scratch. Goats may also roll on the ground in an attempt to relieve irritation.

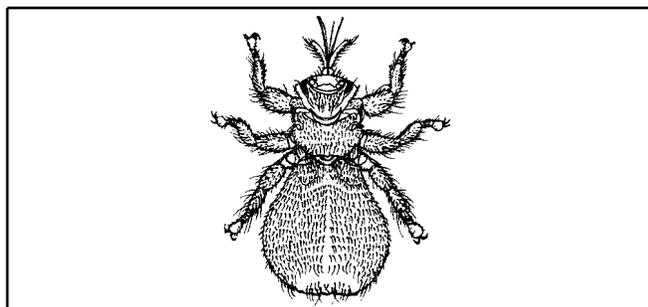


Figure 2 . Ked.

Keds usually do not cause great damage if the animal is fed on a highly nutritious diet, but goats grazed throughout the year on pasture or range may acquire heavy burdens of keds during winter and early spring.

Eggs are retained and hatch within the body of the female ked and develop into fully grown larvae ready to pupate. These larvae are then glued to hairs of the host. A female ked is capable of developing only one larvae at a time. During the female's life of 100 to 130 days, she produces around 10 to 15 young, giving birth every 8 to 9 days. The pupal stage lasts from 18 to 30 days.

Myiasis (Blow Fly Larvae)

Myiasis is the presence of fly larvae in the host. Several kinds of maggots infest the wounds of warm-blooded animals; however, the only one that feeds exclusively on live flesh is the primary screwworm. Sterile male releases have eradicated the primary screwworm fly from the United States; but there is constant danger of reinfestation.

Other species such as the secondary screwworm and other blow flies may also infest wounds. These species normally lay their eggs on carcasses of dead animals and may occasionally occur in open wounds. Although these species may cause worry, they will not consume living flesh and will feed primarily on dead flesh and wound secretions. Infestations of secondary screwworm often follows injury which produce prevalent wounds or management practices which allow animals to develop bacterial skin infestations. These problems must be cleared up to prevent secondary screwworm infestation.

There is no simple way to differentiate between primary screwworm and other fly larvae. Any suspected screwworm case should be reported to the County Extension Director. Samples of eggs and maggots should be saved in a small container filled with 70 percent alcohol solutions.

Mites

Itch or mange mites (*Psoroptes*, *Sarcoptes*) feed on the surface or burrow within the skin, making very slender, winding tunnels from 0.1 to 1 inch long. The fluid discharged at the tunnel openings

dries to form nodules. A toxin is also secreted which causes intense irritation and itching. Infested animals rub and scratch continuously. Infestations are contagious and treatment of all animals in a herd is essential to achieve control. Delayed egg hatch requires retreatment at 10 days.

The most common mange of goats is Psoroptic ear mite (*Psoroptes caniculi*) or scab mite. It lives in the auditory canal and temporarily on the body.

Sticktight Flea

Fleas are small, wingless insects varying from 1.0 to 8.5 mm in length. They are narrow insects compressed on the sides with spines directed backwards.

Most species move about a great deal and remain on the host only part of the time to obtain a blood meal. The legs are well developed as they can jump as far as 7 to 8 inches.

The flea has egg, larva, pupa, and adult stages. Under favorable conditions, a generation can be completed in as little as 2 to 3 weeks. Mating takes place on the host and eggs are laid on the host. Since they are not attached, the eggs drop to the ground and hatch in from 2 days to several weeks. Development occurs most commonly in the bedding of the resting area of the host.

The larvae are very small worm-like, legless insects with chewing mouthparts. In several weeks they go through 3 larval stages, feeding on organic debris. The pupal stage lasts approximately one week, then the newly emerged flea is ready to feed on blood within 24 hours.

The sticktight flea, the most common flea, is a small species which attack goats and other domestic animals. It attaches firmly to its host usually about the face and ears. The sticktight flea female attaches and may become imbedded in the tissue. This species remains attached to its host for as long as 2 to 3 weeks. During this time eggs are laid. They drop to the ground and hatch into larvae. Large populations of this flea may cause ulcers on the head and ears. Flea infestations often spread to other animals including man.

External Parasite Control Recommendations for Dairy Goats

Using Pesticides Wisely

Very few pesticides are registered for control of parasites on dairy goats. Read all warnings, directions, and precautions carefully to insure proper usage. Remember that goats are smaller animals than cattle and require proportionately less pesticide for adequate treatment. Be careful not to over treat dairy goats. Spray animals with enough pressure to penetrate the hair coat and wet the skin. Less than 1 quart of spray should be enough to produce complete coverage per animal.

Table 2. Pesticides Available for Goats.

Trade Name (Formulation)		Common Name - %		
Site(s)	Pest(s)	Re-Entry Time	Preharvest Time	Retreatment Interval
Atroban 42.5% EC (Emulsifiable concentrate)		Permethrin - 42.5%		
Goats	Horn Flies, House Flies, Lice, Mites, Ticks	None	None	14 days
Apply sufficient spray to thoroughly wet animals. Do not contaminate water, food or feed by storage or disposal. May be used as a dip or spray. Apply sufficient spray to thoroughly wet animals. Do not contaminate water, food or feed by storage or disposal.				
Catron IV (Aerosol)		Permethrin - 0.50%		
Goats	Gnats, Horn Flies, House Flies, Lice, Screwworm, Ticks	None	None	None
Most commonly used for wound protection.				
Co-Ral Animal Insecticide (Wettable/soluble powder)		Coumaphos - 25.0%		
Goats	Horn Flies, Keds, Lice, Screwworm, Ticks	None	3 days	14 days
SPRAY OR DIP: Apply specified dosage in 100 gallons of water for complete wetting. Treat thoroughly all wounds and injuries. Repeat as necessary for spray treatments but not more often than every 14 days. Repeat as necessary for dip treatments but not more often than every 10 days. Do not treat animals within 3 days of slaughter. Do not treat lactating dairy goats. Do not treat non-lactating dairy goats within 14 days of freshening. Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old. Do not dip animals when they are over-heated.				

Table 2. Pesticides Available for Goats.

Trade Name (Formulation)		Common Name - %		
Site(s)	Pest(s)	Re-Entry Time	Preharvest Time	Retreatment Interval
GardStar 40% EC (Emulsifiable concentrate)		Permethrin - 40%		
Goats	Gnats, Horn Flies, House Flies, Keds, Lice, Mites, Ticks	None	None	14 days
Do not use on sick, old or debilitated animals.				
MoorMan's Insectaban EC Insecticide (Emulsifiable concentrate)		Permethrin - 5.7%		
Goats	Gnats, Horn Flies, House Flies, Keds, Lice, Mites, Ticks	None	None	14 days
Apply according to label directions over whole body surface. Be sure to thoroughly wet animal.				
Purina Hard Hitter 5.7% (Emulsifiable concentrate)		Permethrin - 5.7%		
Goats	Gnats, Horn Flies, House Flies, Keds, Lice, Mites, Ticks	None	None	14 days
Purina Hard Hitter Aerosol (Aerosol)		Permethrin - 0.50%		
Goats	Gnats, Horn Flies, House Flies	None	None	None
Spray thoroughly, but not into eyes.				
Purina Hard Hitter Aqueous Spray (Emulsifiable concentrate)		Permethrin - 0.50%		
Goats	Gnats, Horn Flies, House Flies, Lice	None	None	None
Purina Malathion Spray (Emulsifiable concentrate)		Malathion - 54.6%		
Goats	Horn Flies, Keds, Lice, Ticks	None	None	14 days
Do not use on dairy goats. Do not treat animals under 1 month of age.				