

Controlling

INSECTS AND MITES OF SHEEP AND GOATS

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ALL INSECTICIDES AND MITICIDES are poisonous in varying degrees. Handle them cautiously so that they will not poison livestock, children, or the user. When using insecticides on livestock, do not increase the dosages. Measure all materials carefully.

Apply chemicals to sheep and goats no closer to slaughter or milking than the time given in this bulletin. Read the package label for additional instructions on how to safely use pesticide chemicals. Meat and milk can be seized if they contain more insecticide or miticide than allowed.

There is some danger to sheep and goats when spraying or dipping them in winter. Instead, use a dust whenever possible. However, if you must spray or dip in winter, treat on a warm day and if this is done in a barn, turn the animals out to dry immediately. You are taking a risk if you spray or dip during cold weather.

Do not allow insecticides, fungicides, and nematocides to drift onto pastures, hayfields, food crops, wood lots, non-crop areas, lakes, or ponds unless there is no danger involved. Certain restrictions placed on chemicals when used on animal or human food crops are listed in this bulletin. When applied to water or wildlife areas, some of the materials listed may kill fish or wildlife.

To determine the dangers of drift, read the label on the package. Fol-

low the same restrictions for insecticide and miticide drift as for direct application of the same materials to food crops.

For dangers of fish and wildlife poisoning from insecticides, fungicides, and nematocides applied to water or areas other than crop lands, get information from your county conservationist.

LICE

All stages of the biting louse, the blood sucking body louse, and the foot louse live on the animals. The eggs are glued to the hairs, but can hatch for several weeks after being dislodged from animals. The immature and adult lice can survive a week off the host.

Biting or red chewing louse

It is 1/20 inch long. The body is light brown in color; the head is reddish and broadly rounded in front. Each segment of the abdomen has one row of hairs running across it. It moves about chewing wool fibers and skin scales.

Sheep infested with red chewing louse often rub and scratch. Large numbers of them can cause raw skin sores when they feed in one place.

Blood sucking body louse

This pest infests the entire body and face next to the skin, often clustering in large groups. It closely resembles the blood sucking foot louse, but is more slender and the head is twice as long as broad. It is up to 1/12 inch long and dark-gray or bluish in color.

The blood sucking body louse injures sheep mainly by sucking blood which robs animals of food.

Blood sucking foot louse

It is about 1/12 inch long and dark-gray or bluish in color. The head is about as long as wide. Each segment of the abdomen has two rows of hairs running across it.

The foot louse is found on the legs in the short hairs below the true wool. Generally, it is not so damaging to sheep as the sucking body louse or the red chewing louse.

Five lice infest goats and can be controlled as suggested for sheep lice.

CONTROL

All lice affecting sheep and goats are controlled with similar chemicals. The following information on the amounts, formulations, and directions for insecticide use apply equally well to the different types of lice. When important, differences in methods of application will be indicated.

Louse control in Michigan is normally done in early summer by dipping. If this treatment has been missed or sheep show infestation in late fall, USE A DIP, SPRAY OR DUST BEFORE COLD WEATHER OR ON A WARM DAY. Two applications (14 days apart) of malathion normally eradicate lice from a flock, providing all animals are treated and newly purchased ones are isolated and treated before turning them in with others. A single treatment for lice does not necessarily eliminate them from the animals. Lice eggs are not

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normally killed by the chemicals approved for louse control.

Elimination of lice from a flock does not mean reinfestation will not take place. Lice naturally decline in numbers during warm weather and increase in cool or cold temperatures. Hence, they are capable of doing more damage to sheep in winter than in summer. Good flock management requires inspection for lice in the fall and treatment applied if needed.

Apply any treatment thoroughly. Satisfactory control of lice is obtained only when the insecticide penetrates the wool to the skin. The only really good means of controlling foot lice is to dip feet and lower legs of sheep.

Dip

A dip offers the best means of controlling lice and keds. But as with any method, it has drawbacks. Dipping vats must be available and kept in good repair.

For best results, both the body and head must be dipped. Allow no animal to escape dipping. Make a new batch of dip when it becomes dirty. **WARNING:** Do not add chemical to old dipping water. Start from scratch when making a new dip or adding more chemical. If the chemical is concentrated in a dip by using too much or by adding to an old dip, poisoning of animals and excessive residues in the meat can result.

To each 100 gallons of water in a dipping vat, use only one of the following insecticides and the amount suggested: (Note: when the amount of water in the dipping vat is less than 100 gallons, use a proportionate amount of insecticide, that is, one-half the suggested amount for 50 gallons, etc.).

- DDT, 1 gallon of an emulsion containing 2 pounds of active ingredient per gallon, or 4 pounds of 50 per cent wettable powder.
- Deltav, 2 4/5 pints of an emulsion containing 4 pounds of active ingredient per gallon.
- Lindane, one pint of an emulsion containing 1.6 pounds of active ingredient per gallon, or 4/5 pound of 25 per cent wettable powder.
- Methoxychlor, 1 gallon of an emulsion containing 2 pounds of



Sheep infested with lice scratch and rub. This often results in stringy or pulled wool.

- active ingredient per gallon, or 4 pounds of 50 per cent wettable powder.
- Ronnel (Korlan), 1 gallon of an emulsion containing 2 pounds of active ingredient per gallon.
- Toxaphene, 1/2 gallon of an emulsion containing 4 pounds of active ingredient per gallon (1/4 gallon of an emulsion containing 8 pounds), or 4 pounds of 50 per cent wettable powder.

See the hazard and use warnings at the end of this bulletin.

Spray

Different spray pressures are needed to control insects and mites affecting sheep (and goats). For example, a spray for lice and keds (sheep ticks) must be applied at high pressure on animals with a thick, wool coat. Heavy coats of wool (like some sheep have in winter) are harder to penetrate than light ones. Pressures of 100 to 250 pounds are high enough to control most insects and mites of sheep and goats.

When low spray pressures are used (100 pounds pressure or less) a small amount of wetting agent will improve penetration of a heavy coat of hair (see instructions on label for amount). However, do not add too much wetting agent because it will cause heavy runoff, reducing the effectiveness of the spray. Usually excessive foaming of the water in the spray tank, indicates too much wetting agent is being used.

To each 100 gallons of water in a sprayer, use only one of the following insecticides and the amount suggest-

ed: (Note: when the amount of water in the sprayer is less than 100 gallons, use a proportionate amount of insecticide; that is, one-half the suggested amount for 50 gallons, etc.).

- Co-ral, 8 pounds of 25 per cent wettable powder.
- DDT, 2 gallons of an emulsion containing 2 pounds of active ingredient per gallon, or 8 pounds of 50 per cent wettable powder.
- Deltav, 2 4/5 pints of an emulsion containing 4 pounds of active ingredient per gallon.
- Diazinon, one pint of an emulsion containing 4 pounds of active ingredient per gallon. Apply 1 quart per animal. For high pressure equipment, use 1/2 pint of the emulsion and apply 1 gallon of the mixed spray per animal.
- Lindane, 2 pints of an emulsion containing 1.6 pounds of active ingredient per gallon or 1 3/5 pounds of 25 per cent wettable powder.
- Malathion, 6 1/2 pints of an emulsion containing 5 pounds of active ingredient per gallon, or 16 pounds of 25 per cent wettable powder.
- Methoxychlor, 2 gallons of an emulsion containing 2 pounds of active ingredient per gallon, or 8 pounds of 50 per cent wettable powder.
- Ronnel, 1 gallon of an emulsion containing 2 pounds of active ingredient per gallon.



Wool removed to show the scabs of sheep scabies.

- Rotenone, 2 pounds of 5 per cent or 2½ pounds of 4 per cent wettable powder.
- Toxaphene, 1 gallon of an emulsion containing 4 pounds of active ingredient per gallon (½ gallon of an emulsion containing 8 pounds), or 8 pounds of 50 per cent wettable powder.

See the hazard and use warnings at the end of this bulletin.

Dust

It is used as bought without further dilution with diluents or mixing with water. To be effective, it must penetrate through the wool to the skin.

Dust penetration of the wool of sheep is influenced in the same way as a spray. That is: heavy wool is a hindrance and light wool usually allows penetration to the skin. Based on wool texture alone, differences in control of keds range from about 100 per cent on animals with loose coats to about 35 per cent for those having thick wool. Dusters should be power driven except for a few animals where a hand duster may suffice.

Use only one of the following:

- Lindane, 1 per cent dust.
- Malathion, 5 per cent dust.
- Rotenone, ¼ or 1 per cent dust.

See the hazard and use warnings at the end of this bulletin.

SHEEP TICK OR KED

This insect is a wingless fly. It is brown, ¼ inch long, and has 6 legs.

The abdomen is sac-like; and the mouth parts are of the sucking type. Its food is blood and lymph taken from sheep, and occasionally from goats. The insect stains the wool and robs animals of nutrition.

Sheep keds usually spend their entire lives on the animals, except when accidentally dislodged from them. However, they crawl readily from sheared ewes to young lambs at shearing time. The females give birth to living young (maggots) which are glued immediately to hairs mainly next to the belly and neck. These are ¼ inch long, whitish, oval, and without legs. Within 24 hours, the skins of the maggots turn brown forming pupal cases. The adult keds "hatch" from the pupal case in 3 to 5 weeks depending on the temperature since more time is needed to change from maggots to the adults in winter.

CONTROL

The methods and insecticides for sheep tick or keds are the same as for lice. Use one of the following materials according to the direction given in the section on lice control:

Dip

DDT, Delnav, lindane, ronnel, or toxaphene.

Spray

Co-ral, DDT, Delnav, Diazinon, lindane, malathion, ronnel, rotenone, or toxaphene.

Dust

Dieldrin, 1½ per cent dust.
Co-ral, ½ per cent dust.
Malathion, 5 per cent dust.
Rotenone, ¼ or 1 per cent dust.
Do not use lindane.

Note:

Dieldrin is a very effective treatment for keds, but its use is limited to a single dust treatment of adult animals immediately following shearing. Use other dusting materials within the limits given in the section on Warnings.

SHEEP SCAB OR SCABIES

This trouble is caused by a mite. It is white or yellowish and very small — barely visible to the unaided eye. It pierces the skin with very sharp mouth parts, causing inflammation and itching.

Scabs form over the mites where blood and serum ooze from the wounds made by these pests.

CONTROL

When sheep have scabies, they are subject to State and Federal quarantine. Consequently, all sheep known to have or suspected of having the problem must be reported to the State Veterinarian's Office. In making this report, you may ask the help of your county Agricultural Agent, your local veterinarian, or the Animal Husbandry Department, Michigan State University, East Lansing, Michigan.

Warning: None of the materials suggested in this bulletin for control of keds, lice, stable fly, and fleece worms (blow flies) can be used for scabies unless approved by the State of Michigan Veterinarian's Office.

FACE FLY

These insects resemble the house fly but are generally a little larger. The females have a grayish-green abdomen and are hard to tell from house flies. Males have orange-yellow abdomens with a black line down the center and eyes that almost touch; they feed in summer on nectar and pollen and are not found on the animals. Female face flies feed on animal secretions from around the eyes, the lips, and in and around the nostrils — hence their name. Larvae feed on fresh cow dung, and possibly in other kinds of excrement.

CONTROL

Face fly control is difficult. Apply the treatment to head, neck, shoulders, and front legs. All of the following treatments may be needed:

(1) Use pyrethrum oil solution (distillate) containing 2/10 of 1 per cent pyrethrins plus 2 per cent piperonyl butoxide. Do not dilute. Apply 1 to 2 fluid ounces per animal daily (in

the morning). Apply only as a mist. Do not wet the hair or skin.

Pyrethrum is the only oil-type formulation suggested in this bulletin for use on sheep or goats.

(2) For sprays use one of the following insecticides to 100 gallons of water:

- **DDVP**, 1 gallon of an emulsion containing 4 pounds of active ingredient per gallon. Apply only 2 fluid ounces per animal. Note: (16 fluid ounces equal one pint).
- **Clodrin**, 1 gallon of an emulsion containing 2 pounds of active ingredient per gallon. Apply treatment thoroughly.
- **Delnav, Diazinon, malathion, and ronnel** may also be used for face fly. Follow the dosage rates and restrictions as given for lice.

See the hazard and use warnings at the end of this bulletin.

Several other insects annoy and injure sheep and goats:

STABLE FLY

It can be told by the slender stiff beak that projects forward from the lower surface of the head and by the seven spots on the broad, gray abdomen. They cluster around the ears, face and legs of the animals, sucking blood.

CONTROL

Since the insect breeds in manure and fermenting damp straw, scattering these or handling them in such a way that they will dry out will help control the pest. Other control measures for treating stable fly resting places inside and outside barns follow: Use only one material to 100 gallons of water and follow label directions carefully.

- **Dimethoate**, 2 gallons of an emulsion containing 4 pounds of chemical per gallon. Apply 1 gallon to 1000 square feet of surface.
- **Diazinon**, 16 pounds of 50 per cent wettable powder. Apply 1 to 2 gallons of the spray to each 1,000 square feet of barn surface.
- **Ronnel**, 4 gallons of a 2 pounds per gallon emulsion. Apply 1 gallon to each 1,000 square feet of barn surface.

Other insecticides that can be used for stable fly control inside and outside buildings are: malathion, DDVP, lindane, and Clodrin. For these materials follow label directions carefully.

See the hazard and use warnings at the end of this bulletin.

FLEECE WORMS

These worms may be one or more of several fly maggots, but usually the green and bluebottle flies (blow flies) are responsible. The maggots have blunt tails and pointed heads. They live in matted and soiled wool. They often occur in open wounds.

CONTROL

A smear of one of the following materials can be brushed or smeared into and around wounds:

- **diphenylamine**, 35 per cent (also known as smear 62.
- **lindane**, 3 per cent (also known as EQ - 335.)
- **ronnel**, 5 per cent.

Use the least amount that will treat the wound.

Sprays of Co-ral and ronnel may also be used. Follow the directions as given for lice.

See the following use warnings.

WARNINGS AND USE INFORMATION

- **General Warning:** Do not use oil-base emulsions for treating sheep; oil types tend to stain the wool and do not penetrate it as well as others. As a general rule: Do not treat sick animals or those under stress with any insecticide. Read the label for further information. Follow directions.
- **Co-ral:** Do not treat sick animals or apply to lambs less than 3 months old. Spray those 3 to 6 months of age only lightly. Do not use Co-ral with synergized pyrethrins, allethrins, or synergists. Stop treatment 15 days before slaughter of any animal or 14 days before freshening of milking goats.

● **Clodrin:** A thorough treating of animals is permissible, but prolonged spraying or drenching should be avoided. Do not apply more often than every 7 days. Avoid contamination of food or feed.

● **DDT:** Do not use it on milking goats. On sheep or goats, apply no treatment closer to slaughter than 30 days. Avoid contamination of feed and food.

● **Dichlorvos (DDVP, Vapona):** Daily use in water as a mist spray is permissible. However, continue treatments only as long as they are needed. Avoid contamination of feed and food.

● **Dioxathion (Delnav):** Avoid dipping animals less than 3 months old. Apply it only at 2-week or longer intervals. Do not apply to milking goats or within 30 days of slaughter of any animal.

● **Diazinon:** Do not use it within 14 days of slaughter, or on milking goats. Do not contaminate feed or drinking water.

● **Dieldrin:** It is only approved for use immediately after shearing. Only one treatment is allowed and this must be applied 90 days before slaughter of any animal.

● **Dimethoate:** Do not apply it to animals, nor contaminate feed. Remove sheep or goats from buildings before spraying.

● **Lindane:** Do not use on milking goats. Stop dust or spray treatments 30 days before slaughter; dips, 60 days. Avoid treating lactating sheep or goats, or sick animals. Do not dip animals less than 3 months old.

● **Malathion:** Do not treat sick animals or those less than one month of age. Do not apply to milking goats. No limitation on slaughter animals.

● **Methoxychlor:** Do not apply to milking goats.

● **Pyrethrum:** This material and rotenone are fairly free of hazard, but prolonged treating should be avoided. Apply only mist treatments of oil-type pyrethrins or rotenone. Do not apply oil-type sprays or dips. Pyrethrum and rotenone are the only insecticides listed in this bulletin that can be used safely on milking goats.

● **Ronnel (Korlan):** Do not use it on milking goats or any sick animal. Apply only at two-week or longer intervals. Stop treating on goats 21 days before freshening or 12 weeks (84 days) before slaughter of sheep or goats. Do not contaminate feed or drinking water.

● **Rotenone:** Spraying animals in an enclosed barn may create breathing problems. Hence, for those animals treated in enclosures, let them out immediately to dry. See the pyrethrum section for additional information.

● **Toxaphene:** Do not treat milking goats. Stop its use 28 days before slaughter of any type of animal.