

# Internal and External Parasites of Sheep

Parasites of sheep cause thousands of dollars in losses in the sheep industry annually. Control of these parasites is easy in some respects and extremely complicated in others.

It has been demonstrated that close grazing of pasture will produce the maximum pounds of lamb per acre. Close grazing, however, compounds the buildup of internal parasites. There are satisfactory methods for controlling external parasites. A number of the internal parasites can be controlled adequately, but there are others for which no satisfactory treatment exists at present. Research is being conducted around the world on parasite control. The Food and Drug Administration will not permit some materials used in other countries to be used here on sheep that are going to slaughter.

## Internal Parasites

### Gastro-intestinal parasites

Suckling lambs are more affected by parasite load than adult sheep. This is partially explained by the number of worms in relation to the pounds of live weight. For example, 1,000 mature stomach worms will influence a 50-pound lamb much more than a 150-pound ewe. In addition to this, there is a certain amount of immunity to stomach worms built up in adult sheep, whereas lambs generally have no immunity.

You might suspect the presence of internal parasites when a rough wool coat is observed on the lambs. Other visual symptoms include scouring, a pot bellied appearance, anemia, bottle jaw or swelling under the jaw, or a humped up, unthrifty appearance. A heavily parasitized sheep will have a pale, anemic color in the tissues around the eyes and on the gum areas.

*This report is the result of a series of producer meetings in western Oregon in 1968, where most of this information was presented. It is a joint effort of Mike Schlegel, graduate student in the department of vet. med., John H. Landers, Jr., John A. Leffel, Wayne D. Mosher, Ben A. Newell, and Guy E. Reynolds, all Extension staff members of Oregon State University. External parasite controls are by R. L. Goulding, entomologist, and Robert R. Robinson, Extension entomologist, OSU. To simplify the information, it is necessary to use trade names of products, equipment, firms. No endorsement of named products is intended, nor is criticism implied of similar products not mentioned.*

The life cycles of most gastro-intestinal parasites are similar. The mature worm sheds the eggs in the gut; the eggs are passed out onto the pasture with the fecal material. When weather conditions are suitable, the eggs hatch. The larvae will crawl up the blades of grass on the moisture to be picked up as the sheep eat the grass. The larvae then develop into mature worms inside the sheep's gut and the cycle starts over. About 90 percent of these larvae will die if they are not picked up by the sheep in about 30 days from hatching. Research at Oregon State University has shown that some larvae will over-winter on the forage in western Oregon.

The gastro-intestinal parasite harms the sheep by two methods; first by sucking the blood from the gut wall and secondly by damaging the wall of the gut, which renders the absorption of nutrients less effective. The damage contributes to scouring because the water is not absorbed by the gut wall.

In addition to the above mentioned methods of detecting the presence of internal parasites, it probably is advisable to take fresh fecal samples from some specific sheep to your veterinarian and ask him to run an egg count for you. The veterinarian takes a known quantity of fecal material and dilutes it with a suitable solution. The eggs float to the top of the mixture and he is then able to count the number of eggs that are present. The veterinarian will have knowledge of the number of eggs per gram of fecal material that should cause problems. The egg count is not always a sure method of determining parasitism, but is a useful tool along with visual observation.

### Management

Pasture management plays a very important role in the control of internal parasites. As was previously stated, if the worms are not picked up by the sheep in a 30-day period, the majority of them are dead. This is a great aid in breaking the life cycle of the many different worms that live in the sheep's gut.

This 30-day rotational cycle presents problems in pasture management. During the spring growing season, a 30-day growth on most improved pastures, will produce feed that is somewhat unpalatable to the sheep; therefore, they will not utilize the pastures to the greatest advantage.



## Treatment

Some sheep producers treat every 30 days during the grazing period whether or not the sheep need the treatment. This is good insurance; however, it will considerably increase the annual cost of growing sheep.

In nearly all cases, the foundation flock will be infected with parasites and the pastures will be infected. Therefore, a worming program must be set up and followed. There is no drug today that will kill all of the internal parasites. It is necessary that we learn to live with a limited infestation. Management can assist in holding down the degree of infestation by breaking the life cycle of the parasite.

Internal parasites in ewes can greatly affect milk production. Research has shown that some clinical infestations can reduce the milk flow from 50 down to 10 fluid ounces per day. An inadequate milk supply helps to cause internal parasite infestation of lambs. This is brought about by lambs eating more forage, thereby picking up the larvae from this forage. Sub-clinical infestations of worms can reduce weight gains from 12 to 30 percent. A well-fed animal can do well with a much larger parasite load than a thin animal.

After worming the ewes, it normally takes half a day to kill the eggs in the gut and then it is safe to turn the sheep to a new pasture. The nonviable eggs that are passed from the ewe will have been killed by the medication.

Several chemical compounds are currently available for worming sheep. These are commonly known as anthelmintics. No one compound will remove all of the internal parasites. They should be looked upon as one of the necessary management tools for the producer to incorporate in an overall parasite control program.

The repeated use of any one anthelmintic tends to produce strains of parasites resistant to the particular chemical being used. It is desirable to alternate anthelmintics in order to obtain the best results. Worming preparations currently available include: Thibenzol, Tramisol, Loxon, and phenothiazine. Each product should be used according to the manufacturer's recommendations which will be on the package. Dose adequately but not excessively. Observe withdrawal time when marketing slaughter lambs.

The schedule for worming will vary according to local ranch conditions. Generally, it is advisable to worm all sheep two weeks after the first killing frost in the fall. Lambs on pasture for four weeks in the spring may require worming. When daily temperatures exceed 60 degrees, larvae from contaminated pastures become active and heavy worm burdens can develop. Repeated worming may be necessary during warm months in the presence of adequate moisture.

## Coccidiosis

The principal symptoms of coccidiosis in lambs are diarrhea and dehydration. The manure may or may not contain traces of blood. Coccidiosis is rapid acting. The time interval from infestation to maturity of the coccidia is about one week. There are from 10 to 15 different kinds of coccidia present, but only a few are severely pathogenic. Sulfa drugs are generally recommended for coccidiosis:

Some of them are sulfabromazine, sulfamethazine, sulfaquinoxaline, or SEZ (sulfaethoxyypyridazine), bolus, or oblet. Some growers are mixing liquid sulfas with their regular drench medication when worming lambs early in the season.

Some of the same symptoms previously mentioned for stomach worms are present when lambs are infected with coccidia. The mature sheep may be a carrier of coccidia and the lambs, which have no resistance are subject to most of the damage.

## Lungworms

Lungworms are thread-like worms that live in the lung of the sheep. Generally, they are found in the bronchial tubes of the lungs. Lungworm damage is characterized by a chronic cough in sheep and the worms contribute to pneumonia because of mechanical damage to the lungs. If lung worm infestation is suspected, a diagnosis is necessary. Control of this parasite differs from that for other parasitic diseases.

The greatest monetary loss is when young animals become infested with these parasites. Previously infected sheep may have some resistance to lungworms.

Tramisol is the drug of choice when treating sheep for lungworms. When used according to directions, it has proven effective for the removal of the adult and larval forms of the sheep lungworm. Remove affected sheep from the contaminated pasture and provide supplemental feed (hay and grain) until the sheep are gaining. At this time, pastures free of lungworm contamination may be used as a feed source.

## Liver fluke

Liver fluke is common in Oregon sheep, Liver fluke infestation will cause a reduction in weight gain, condemnation of livers upon slaughter, death due to liver rot, and contribute to Black Disease.

Dr. J. N. Shaw, OSU Veterinary Department, identified the snail as the intermediate host of the liver fluke many years ago. The eggs of the fluke pass out in the fecal material and hatch. They make contact with the snail in wet or marshy areas. In due time, they leave the snail and crawl up the vegetation and the sheep picks up the encysted larvae on the grass and the life cycle is continued.

The adult flukes are found in the bile ducts of the liver and the immature flukes are found in the liver tissue.

Treatment drugs for liver fluke are carbon tetrachloride and hexachlorethane. Unfortunately, both of these materials are quite toxic and are effective only on mature flukes. Heed the warning label on the container.

Immature flukes may be picked up by the sheep at any time of the year. Treatment is most effective in the fall when most of the flukes are mature. The sheep will show symptoms similar to other parasitic infestations.

Complete burning of vegetation along drainage ditches and wet spots will aid materially in controlling flukes. Copper sulfate in the wet areas and ditches may kill the snails. (Excessive amounts of copper could cause copper poisoning in sheep.)

*Continued on page 4*

## EXTERNAL PARASITE CONTROL, SHEEP AND GOATS

| Pest                              | Insecticide   | Dosage*<br>Amount of insecticide per 100 gallons<br>as spray or other as indicated   | Tolerance**<br>p.p.m.   | Interval between application and<br>slaughter—remarks***  |
|-----------------------------------|---|--|---|---|
| SHEEP KEDS                        | Diazinon—0.03% as spray,<br>• 2% as dust                                      | 0.5 lb 50% W.P.<br>1.5 oz. per animal  | 0.75 in meat<br>fat & meat<br>by-products                                 | Do not treat within 14 days of<br>slaughter. Do not use on goats.   |
|                                   | Co-Ral—0.125% as<br>spray or dip  | 4 lbs. 25% W.P. (sheep and goats)  | 1 in meat,<br>fat & meat<br>by-products                                   | Do not apply within 15 days of<br>slaughter. Do not use on lactating<br>dairy goats. Do not use within 14<br>days of freshening of dairy goats. |
|                                   | Toxaphene—0.5%<br>as spray<br>—0.25% as dip<br>—5.0% as dust                  | <i>As spray</i> —10 lbs. 40% W.P., or<br>0.5 gal. 8 lbs./gal. E.C.<br><i>As dip</i> —5 lbs. 40% W.P., or<br>0.25 gal. 8 lbs./gal. E.C.<br><i>As dust</i> —1 to 2 oz. per animal  | 7 in fat  | Do not apply within 28 days of<br>slaughter. Do not use on dairy<br>goats.  |
|                                   | Malathion—0.5% as spray<br>—5% as dust  | 16 lbs. 25% W.P., or<br>1 gal. 57% E.C.<br>1 to 2 oz. per head   | 4 in meat &<br>meat by-<br>products                                       | No time limitation between appli-<br>cation and slaughter. Do not<br>apply to dairy goats.  |
|                                   | Korlan (ronnel)—0.25%<br>as spray   | 1 gal. 24% E.C.  | 10 in fat,<br>4 in meat &<br>meat by-<br>products<br>1.25 in milk<br>fat. | Do not apply within 28 days of<br>slaughter. Do not use on lactating<br>dairy goats. Do not use within 7<br>days of freshening of dairy goats.  |
| LICE                              | Toxaphene—0.5%<br>as spray<br>—0.25% as dip<br>—5.0% as dust                  | <i>As spray</i> —10 lbs. 40% W.P., or<br>0.5 gal. 8 lbs./gal. E.C.<br><i>As dip</i> —5 lbs. 40% W.P., or<br>0.25 gal. 8 lbs./gal. E.C.<br><i>As dust</i> —1 to 2 ozs. per animal | 7 in fat  | Do not apply within 28 days of<br>slaughter. Do not use on dairy<br>goats.  |
|                                   | Malathion—0.5% as spray<br>—5% as dust  | 16 lbs. 25% W.P.<br>1 to 2 oz. per animal  | 4 in meat &<br>meat by-<br>products                                       | No time limitation between appli-<br>cation and slaughter. Do not apply<br>to dairy goats.  |
|                                   | Korlan (ronnel)—<br>0.25% to 0.5%<br>as spray or dip<br>Korlan-2<br>(pour on) | 1 to 2 gals. 24% E.C.<br><br>4 cc lambs<br>8 cc ewes   | 10 in fat,<br>4 in meat &<br>meat by-<br>products<br>1.25 in milk<br>fat. | Do not apply within 28 days of<br>slaughter. Do not use on lactating<br>dairy goats. Do not use within 7<br>days of freshening of dairy goats.  |
|                                   | Diazinon—0.03% as spray<br>—2% as dust  | 0.5 lb. 50% W.P. (sheep only)<br>1.5 oz. per animal (sheep only)   | 0.75 in fat,<br>meat, &<br>meat by-<br>products                           | Do not apply within 14 days of<br>slaughter. Do not use on goats.   |
|                                   | Ciodrin—3% as dust  | Dust thoroughly with<br>1-2 oz. per animal, especially<br>around the neck and around the<br>ears.  | 0.02 in meat,<br>fat & meat<br>by-products                                | Repeat in 3-4 weeks if necessary.   |
|                                   | Co-Ral—0.06% as spray<br>or dip   | 2 lbs. 25% W.P. (sheep and goats)  | 1 in meat &<br>meat by-<br>products                                       | Do not apply within 15 days of<br>slaughter. Do not use on lactating<br>dairy goats. Do not use within 14<br>days of freshening of dairy goats. |
|                                   | WOOL<br>MAGGOTS   | Co-Ral—0.125% as spray   | 4 lbs. 25% W.P. (sheep and goats)   | 1 in meat,<br>fat & meat<br>by-products   |
| Korlan (ronnel)—<br>0.5% as spray |   | 2 gals. 24% E.C.   | 10 in fat,<br>4 in meat &<br>meat by-<br>products<br>1.25 in milk<br>fat. | Do not apply within 28 days of<br>slaughter. Do not use within 7<br>days of freshening dairy goats.   |

\* E.C.—Emulsifiable Concentrate

\* W.P.—Wettable Powder

\*\* NR (PP)—No residue, petition pending for a tolerance.

\*\*\* Observe label precautions.

| <i>Pest</i> | <i>Insecticide</i> | <i>Dosage*</i><br><i>Amount of insecticide per 100 gallons</i><br><i>as spray or other as indicated</i>  | <i>Tolerance**</i><br><i>p.p.m.</i>   | <i>Interval between application and</i><br><i>slaughter—remarks***</i> |
|-------------|--------------------|--|---|--|
|             | Ciodrin—0.5% spray | 1 qt. 1.1 lbs./gal. E.C./6 gals.<br>water. Spray animal completely<br>with 1 pt. of mixture.   | 0.02 in meat<br>fat & meat<br>by-products                                       | Repeat as required but not more<br>often than once every 7 days.       |
|             | Ciovap—0.25% spray | 2.5 pts. 1.1 lbs./gal. E.C./16 gals.<br>water. Spray animal completely<br>with up to 1 gal. of mixture.<br>Apply second application in 14<br>days. | 0.02 (Cio-<br>drin)<br>0.02 (Va-<br>pona)<br>in meat &<br>meat by-<br>products. | Repeat as required but not more<br>often than once every 7 days.       |

If treatment for fluke is undertaken, it is *highly* recommended that three or four sheep be treated on a test basis before the entire flock is treated. As was previously stated, the materials used are very toxic and there is a possibility of killing sheep.

### Tapeworms

Tapeworms exist in Oregon sheep; however, it is generally felt they do not cause a great deal of damage. The presence of tapeworms may be identified by finding small segments of the tape in the fecal material. Presence of a large number of tapeworms in the gut may contribute to the slowing down of the elimination process, therefore causing a build-up of toxins in the gut. This has a possibility of contributing to enterotoxemia. Tapeworms can be controlled with diphenthan-70 or lead arsenate compounds.

### Worming equipment

There are many different types of worming equipment on the market. Owners of large flocks should consider using an automatic drenching gun. This will carry a gallon to two gallons of drench material which speeds up the process. The small flock owner could use a two- or four-ounce drenching gun. This small gun will cost a great deal less money than the larger bag-type drenching equipment.

It is suggested that an inflation tube from a milking machine be put over the sharp metal edge on the stem of the metal drenching gun to prevent damage to the delicate tissues of the mouth and throat.

**When additions are made to the flock, treat all of these sheep for internal and external parasites and isolate them for a month from the main flock.**

## External Parasites

### Sheep ked

The sheep ked, or sheep tick, is actually a wingless fly and spends its entire life on the sheep. It is a blood sucker and can cause severe economic damage to a flock of sheep if present in large numbers. The presence of sheep keds is generally observed during winter when sheep are more confined. They have a tendency to rub and scratch to relieve the itching from the bites. Sheep keds are present on the sheep the year around and they are the greatest problem on lambs from one to four months of age.

### Lice

Lice are a fairly common external parasite on sheep. These generally are more of a problem in winter and probably more so on ewes than on lambs. Symptoms of lice include a severe itching by the animal, rubbing on fences

and other projections to relieve the itching from the bites. Lice can be seen usually by parting the wool and watching very closely. They are quite small, light brown to milky color, and less than 1/16-inch long. If the sheep is itching and sheep keds are not a problem, one should suspect lice as the probable cause.

Leg lice are a problem in a number of flocks. It is desirable to use a dipping vat or spray to wet the leg areas thoroughly to eliminate the lice.

It is suggested that an annual treatment for external parasites of sheep is a good practice. This can be done by dusting, spraying, or dipping. The preferable time probably is at shearing, as there is less wool on the sheep and it is easier to control the external parasites than when the sheep are in full wool. However, if you detect sheep keds or lice on your flock don't wait until you shear, but do it as soon as the parasites are observed. Treat every sheep on the farm. Check carefully the time interval required by E.P.A. between the application and slaughter. This will vary from one compound to another.

Various types of equipment can be used for successfully applying dust, including garden dusters, mechanical dusters, a nylon sock, a gunny sack, a quart fruit jar with holes punched in the lid, and numerous other devices. It is desirable to confine the sheep in a relatively small area so they will rub against each other and get better use of the materials being used.

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**Always wear a face mask over your nose while  
dusting or spraying sheep**

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### Wool maggots and fly strike

Wool maggots and fly strike are generally associated with taggy sheep and warm, moist weather conditions. Proper tagging of the ewes will assist in having a clean fleece and thereby cut down on the possible areas where flies can lay eggs. Warm, moist conditions also may cause fly strike in other areas of the fleece. Some of the materials listed on page 3 will assist in fly control. Some have better residual effects and may be applied ahead of time as a preventive when conditions exist where fly strike might become a problem. Fly strike, if not controlled, can often result in the death of the sheep.

The main thing to remember about external parasites is that it is no crime to have them but it is a crime to keep them.