Summary of Reports...

1965 Sheep and Wool Day

Special Report 200

December 1965

Agricultural Experiment Station • Oregon State University • Corvallis
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Sponsored by the Department of Animal Science, Oregon State University, and the Western Oregon Livestock Association
Control of External Parasites of Sheep

R. L. Goulding and R. W. Every

The sheep ked

Sheep keds, frequently referred to as “sheep ticks,” occur in all parts of Oregon. They feed on the blood of their host, causing irritation and reducing the vitality of the animal. There may be loss of wool by rubbing. The fleece of infested animals on close examination has a trashy appearance. Lambs are most noticeably affected and when heavily infested do not gain normally. The control of the sheep ked should be a routine part of good sheep and lamb management.

The sheep ked is a wingless fly that lives on the bodies of sheep and occasionally goats, but no other animals. Infestations develop as a result of contact with infested animals. Eggs hatch within the body of the female ked, and the larvae hatching from these eggs complete their development within the body of the ked. When fully developed, the larva is extruded from the body of the ked. At the time of birth, the larva is covered with a soft white membrane, which turns brown in a few hours and becomes a hard shell or puparium. The puparia are attached to the wool fibers of the host. The period of larval development is usually about 8 or 10 days, and it usually requires from 10 to 24 days before the young tick emerges from the puparium. Mating normally occurs four to five days after emergence. When dislodged from the body of the sheep, emergence from the puparium may not take place for six weeks or more. Pupae which have become detached from their host are unable to withstand freezing weather.

Sheep can be treated for keds at any convenient time. Farm flocks treated in September or October will not have infestations of keds to move from ewes to lambs during the lambing period. Range flocks are often treated immediately after shearing. New animals should be treated before putting them in the flock.

Ticks

True ticks, unlike the sheep ked, are not insects but spider-like animals which have eight legs in the adult stage. They feed on the blood of animals, including man.

Dr. R. L. Goulding is Associate Professor of Entomology, and R. W. Every is Extension Entomologist, Oregon State University.
The so-called “wood or sage tick,” also known as the Rocky Mountain wood tick, *Dermacentor* (andersoni) *venustus*, occurs in many parts of eastern Oregon. In years of tick abundance or in those localities where ticks are numerous, there is a possibility that “wood ticks” feeding on host animals may cause a condition known as tick paralysis. Sheep frequently bleed from wounds inflicted by tick feeding and the blood stains the wool. The blood stained wool may be attractive to adult wool maggots.

Sheep pick up ticks from brush or other foliage. Ticks remain on the sheep only long enough to engorge themselves on blood and then drop to the ground where they lay eggs.

In eastern Oregon, ticks are most abundant during the spring months; April and May at the lower elevations and June in the higher rangeland.

The “wood tick” does not occur in western Oregon. The species of ticks found in the western part of the state are seldom sufficiently abundant to present a problem. In western Oregon, ticks are most frequently found on sheep during the winter or early spring.

**Wool maggots**

Certain “blow flies” may lay eggs around soiled wool or wounds. The larvae of these flies are known as wool maggots or fleece worms. Losses may result from “fly strike” if affected animals do not receive prompt attention. To prevent infestation, especially of ewes at lambing time, many sheepmen practice “crutching” or “tagging” before lambing begins and before green grass and weeds become abundant in pastures. In spite of benefits gained from this practice, sheep may become infested with wool maggots. This is particularly true when considerable rainfall occurs in the spring and when the weather is cloudy, warm, and humid. Such weather prevents the wool from drying and thereby makes it more attractive to flies for egg deposition. Under these conditions, insecticides have proven helpful in preventing “fly strike.”

**Lice**

Lice of sheep have not been a serious problem in Oregon. Two species of sucking or blood feeding lice occur on sheep. The sheep foot-louse has a decided preference for the legs. In moderate infestations, it is found only around the feet and lower portions of the legs. The other species of sucking louse may infest any part of the body.

The biting louse of sheep, sometimes referred to as the red-headed sheep louse, is small—only about one-twentieth of an inch in length. The biting louse does not feed on blood, but feeding activities at the surface of the skin cause intense irritation. Infested animals rub against solid objects and scratch and bite at themselves.

**Control Methods and Materials**

External parasites of sheep can be controlled by dusting, spraying, or dipping. The accompanying chart lists suggested insecticides and methods by which they may be applied.

Large flocks of sheep can be quickly and effectively treated by power dusters. The tubing from the power duster outlets is arranged above and at the sides of a chute through which the sheep are run. With good facilities and sufficient help, sheep can be treated as fast as they move through the chute.

Small farm flocks can be dusted by means of a rotary or a bellows-type hand duster. If only a few sheep are to be treated, the insecticide can be rubbed into the wool by hand.
Sheep can be treated with a high-pressure sprayer. If wettable powder formulations are used, it is essential for the sprayer to have a good agitator in the spray tank. One of the methods of spraying used is to place a dozen or so sheep into a pen about 12 feet square. The spray operator gets into the pen with the sheep to do the spraying, and in this way is able to give the sheep the thorough wetting necessary for control.

If dipping vats are available, there is no more effective method of control than dips.

Before using any insecticide on sheep, read the manufacturer's label on the pesticide container. Be sure it is a formulation suitable for livestock use. Follow all the precautions on the label. Animals that are weakened, emaciated, or under stress should not be treated.

### CONTROL CHART

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Amount of insecticide per 100 gallons of water as spray or dip</th>
<th>Interval between application and slaughter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHEEP KEDS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TICKS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LICE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-Ral—</td>
<td>4 lbs. 25% W.P., dip or spray 1 to 2 ozs. dust per animal</td>
<td>Do not apply within 15 days of slaughter.</td>
</tr>
<tr>
<td>0.125%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5% dust</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diazinon—</strong></td>
<td>½ lb. 50% W.P., spray only 1½ ozs. dust per animal</td>
<td>Do not treat within 14 days of slaughter. Recomended for sheep ked and louse control only.</td>
</tr>
<tr>
<td>0.03% spray only</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ronnel (Korlan)—</strong></td>
<td>1 gal. 24% E.C. as spray only 8 lbs. 25% W.P., dip or spray</td>
<td>Do not apply within 12 weeks of slaughter.</td>
</tr>
<tr>
<td>0.25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Malathion—</strong></td>
<td>1 gal. 57% E.C. or 16 lbs. 25% W.P., as spray only 1 to 2 ozs. per animal</td>
<td>No time limitation between application and slaughter.</td>
</tr>
<tr>
<td>0.5% spray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% dust</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DDT—</strong></td>
<td>8 lbs. 50% W.P., as spray 4 lbs. 50% W.P., as dip</td>
<td>Do not treat within 30 days of slaughter.</td>
</tr>
<tr>
<td>0.5% spray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.25% dip</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Toxaphene—</strong></td>
<td>10 lbs. 40% W.P., or ½ gal. 8 lbs./gal. E.C., as spray 5 lbs. 40% W.P., or ¼ gal. 8 lbs./gal. E.C., as dip 1 to 2 ozs. per animal</td>
<td>Do not apply within 28 days of slaughter.</td>
</tr>
<tr>
<td>0.5% spray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.25% dip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0% dust</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## CONTROL CHART (Continued)

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Amount of insecticide per 100 gallons of water as spray or dip</th>
<th>Interval between application and slaughter</th>
</tr>
</thead>
<tbody>
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<td><strong>TICKS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LICE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lindane—</td>
<td>1 lb. 25% W.P., dip or spray or 11 pts. 20 E.C., dip or spray</td>
<td>Do not spray or dust within 30 days, or</td>
</tr>
<tr>
<td>0.03%</td>
<td>1 to 2 ozs. per animal</td>
<td>dip within 60 days of slaughter. Do not</td>
</tr>
<tr>
<td>1.0% dust</td>
<td></td>
<td>use on emaciated or lactating animals.</td>
</tr>
<tr>
<td><strong>WOOL MAGGOTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-Ral—</td>
<td>4 lbs. 25% W.P., dip or spray 1 to 2 ozs. per animal</td>
<td>Do not apply within 15 days of slaughter.</td>
</tr>
<tr>
<td>0.125% spray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5% dust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ronnel (Korlan)—</td>
<td>2 gals. 24% E.C., as spray 16 lbs. 25% W.P., dip or spray</td>
<td>Do not apply within 12 weeks of slaughter.</td>
</tr>
<tr>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

W.P. = wettable powder.  E.C. = emulsifiable concentrate.

* To avoid excess pesticide residues in animal tissue, be sure to observe the interval between application and slaughter.

**BEFORE USING ANY PESTICIDE ON SHEEP, READ THE PRECAUTIONARY STATEMENTS ON THE LABEL**
A Program of Improved Pastures for Sheep

CURTIS BARKER

In 1950 my 350-acre farm had a carrying capacity of 50 or 60 head of sheep. Today I am running 350 head, and under normal conditions I could handle another 40 or 50 ewes without supplemental feeding except at lambing time.

In 1950 a pasture improvement program was initiated. The 350 acres consisted mostly of various species of brush common to western Oregon and an area containing merchantable timber. About 85% of the farm is hill land.

Much of the brush was cleared with a bulldozer and some areas were cleared by slashing and burning. The areas having rose bushes and poison oak were run over with a rotary brush cutter, and the aftermath was burned before preparing the seed bed. The seed bed was prepared either by lightly disk- or by the use of a spring-tooth harrow. In the burned areas, seed was sowed in the resulting ashbed. The timber areas were cut and burned and seed was sown by plane. Seeding by air was necessary on these steep hills.

Seed mixtures used

The seed mixtures used on hill land had a basic component of subterranean clover and perennial ryegrass with, in most instances, an addition of orchard grass and alta fescue. All of the seedings were done in the early fall.

Another legume which is showing a good deal of promise is New Zealand white clover. Good results have been obtained in getting this clover started on fescue and ryegrass sod on heavier bottom soils by over sowing in February or March. There is an indication that this clover may also do well on some hill soils.

Fertilizer practices

Fertilizer is applied each year at the rate of 200 pounds per acre, using a 0-20-0 fertilizer. On the steeper slopes it is necessary for the fertilizer to be applied by airplane.

Applying fertilizer by plane on the steeper and higher slopes was first initiated five years ago. This method of fertilizing has made it possible to put the ewes and lambs on these pastures in the latter half of February. This is at least one month earlier than was possible before fertilization. In addition, no supplemental feed needs to be provided for these ewes and their lambs.

Pasture rotation

Rotation of pastures is important both to sheep and pastures. To watch a band of sheep turned on to a new pasture is a revelation in itself. My ewes are moved to fresh “saved” pasture just before lambing and again when the lambs are old enough to require additional feed besides their mother’s milk. To produce a fat lamb economically, an adequate supply of feed is necessary at all times.

Medication

Ewes are sprayed or dusted in the fall for lice and tick control and are treated for flukes in early summer and late fall. Also, they are vaccinated for “Black’s Disease” before hot weather.
The last few years the ewes have been wormed in late September or early October. This helps to reduce or eliminate the possibility of the lambs becoming infected the following spring. Since adopting this practice, the first fat lambs sold have received no medication. This would represent about 75% of the lambs.

A short time before and during lambing the ewes on pasture receive a supplement of hay (sometimes in pellet form) and one-half to one pound of range cubes.

**Lambing**

Lambing starts in January, and the heaviest drop of lambs often coincides with the worst storms of the month. The ewes are not confined under shed at any time during lambing but are kept on pasture and checked several times daily. Twin lambs are picked up and placed under shelter until it can be determined that the mother has an adequate supply of milk and that she will accept both lambs. Twin lambs are kept in a twin band until they are at least a month old. Lambs are creep fed until adequate pasture is available, but they are never creep fed in order to fatten them for market. Each lamb is vaccinated for enterotoxemia at three to four weeks of age.

In the spring of 1965, slightly over 300 ewes dropped 425 lambs. Over 400 of these lambs were sold and sent to market. On June 2, 293 of these lambs were sold as fat lambs at an average weight of 96 pounds. The other lambs were sold three weeks later with a large percentage grading as choice or prime.

**Pasture control**

Subclover pastures require heavy usage in order to maintain a good stand of clover. Because it is not always possible to prevent an overburden of grass from developing in the late spring, a rotary clipper is used to hold down excessive plant height. Clipping to a height of 5 or 6 inches keeps the grass in a much more palatable condition and still allows enough clover growth for feed through the dry summer and fall months. The use of a rotary clipper on the steeper slopes is impossible. Therefore, an effort is made to concentrate enough stock on the slopes so that too much of an overburden does not develop. A controlled fire also can be a valuable aid in maintaining an excellent stand of subclover.

There is no better way to produce fat lambs economically and grow lots of wool than through the use of good pastures.
The American Lamb Council, a division of the American Sheep Producers Council, has been promoting lamb for 10 years. A little over three years ago the council concentrated most of its lamb advertising in seven metropolitan centers in the east, the Great Lakes area, and on the west coast.

This emphasis is justified by the facts... and the facts are that over 80% of the nation's lamb tonnage funnels through these "target" areas, and, at the same time, more consumers in these areas are familiar with lamb, at least to some extent, and thus find it acceptable.

In the light of this supply-plus-demand situation, advertising dollars spent in the target areas yield the greatest immediate results in terms of more lamb purchases by those already familiar with it. In addition, supplies are large enough to meet the needs of new lamb users who are encouraged to try it because of advertising.

Of course, the council is working not only toward the short-range goal of moving current lamb supplies profitably, but also toward long-range goals of increasing demand and broadening the market.

Educational advertising

Research, particularly the national lamb study recently completed for the council, is supplying the direction. It has been obvious for some time that lamb has a limited appeal to a limited number of people. Therefore, the primary challenges that confront us are how can we get present lamb consumers to use a greater variety of lamb cuts more often; and how can we get the vast numbers of people who have never eaten lamb to try it and make it a regular part of their menu. In general, the answer seems to be that they must be taught. This is the reason that the council's advertising is basically educational.

This need for how-to-do-it information also dictates the course that the council is taking in its efforts to build up lamb consumption outside the seven primary markets. A major stride in developing new markets is the initiation of special regional promotions that consist primarily of consumer education. The first such regional promotion was conducted in Oregon and Washington in the summer of 1965.

Regional prerequisites

This region met the three prerequisites which the council determined would be necessary to make a promotion pay off. The three are: producer interest, an ample supply of lamb during the promotion period, and cities of sufficient size.

Producer interest is the most important prerequisite because we depend on sheepmen and auxiliary council members to do much of the work and to gain the cooperation of such institutions and agencies as the Extension service, land grant colleges, and state departments of agriculture. The local sheep industry's active participation is also vital, since they will be called upon to take the initiative in conducting such promotions in the future when council personnel are

R. H. Christiansen is a regional manager for the American Lamb Council.
spearheading promotions in other regions.

The size of major cities in a region is an important factor because the council does some advertising in connection with regional promotions, and where there is a concentration of population, such as in the Portland-Vancouver area, it is possible to get more exposure for each advertising message.

**Lamb supply**

As for lamb supply, there is a peak marketing period in June, July, August, and September, during which a surplus of lamb is traditionally shipped out of the area. This, then, was the four-month period set for the regional promotion, with a view toward building up the market for the time when lamb numbers increase, and, in the meantime, providing additional markets for the temporary regional surplus.

**Lamb consumption**

The estimated average yearly lamb consumption per capita in Oregon is 2.99 pounds, but consumption per lamb consumer, based on our national survey, is 8.01 pounds. This is an average per capita consumption of .25 pounds per month, or .67 pounds per month among lamb consumers.

Since the biggest slaughter is seasonal, it is necessary to weight average consumption by high slaughter months. This gives us .38 pounds per capita during June, July, August, and September, or one pound per lamb consumer. For the other eight months, per capita consumption is .19 pounds, or .50 pounds a month per lamb consumer.

The main surplus in these four months is .89 pounds per capita or 2.39 pounds per lamb consumer. Therefore, in order to use the supply available in Oregon, consumption would have to increase .22 pounds per capita or .60 pounds per lamb consumer for each of the four months. That is, there would have to be a total per capita lamb consumption of 3.88 pounds, or 10.4 pounds per lamb consumer. This would break down into .60 pounds per capita per month or 1.60 pounds per lamb consumer per month for the four summer months, and .19 pounds per capita per month or .50 pounds per lamb consumer per month for the other eight months of the year.

**Oregon goal**

These figures indicate a goal for the lamb promotion program in Oregon. It is not expected that this goal will be obtained overnight, but the objective is definitely possible to reach. As a matter of fact, the per capita consumption in California right now is estimated to be above the 10.4 pounds per capita set as a goal in Oregon. Research is in progress at this time to try to isolate the factors that keep per capita lamb consumption in California at a relatively high level, even though the state has greater population growth than the nation as a whole. The findings may be valuable to future promotions in Oregon.

Because data on lamb movement in Oregon during the regional promotion is still being collected and must be analyzed, a measurement of the progress made towards the Oregon goal will not be available until after the first of the year. Results from both the California study and the regional effort should be available for the planning session for the next Oregon promotion.
The World's Largest Lamb Barbecue

JOHN A. LEFFEL

The "world's largest patio party" was held this past summer at the Lloyd Center in Portland, Oregon.

To the benefit of Oregon sheepmen, the event featured one ton of "genuine" milk-fed Oregon spring lamb, which was barbecued by interested producers.

Because of information and facts available to our group, the logical place for our promotion was the metropolitan area of Portland. The group decided the ideal location in Portland would be the Lloyd Center—to promote the "world's largest lamb barbecue in the world's largest shopping center."

The planning stage

Committees were appointed, discussion was held, and it was decided to proceed with the promotion if financing could be made available from the Western Oregon Lamb Show Association and other interested sheep producer groups throughout Oregon. Klamath Basin Sheep Producers offered to assist with lamb preparation and furnish the cooking equipment necessary for the promotion.

The overall purpose of the Lloyd Center event was to acquaint Portlanders with the importance of the sheep industry to Oregon. It was estimated that from 15,000 to 20,000 people could be treated to bite-size samples of sizzling lamb chops and steaks from barbecue pits installed on the Lloyd Center mall.

However, in the initial visit with the Lloyd Center officials, we were informed that we should be prepared to serve possibly between 30,000 and 40,000 people. This number of people normally goes through the mall on any given Saturday. It was estimated that 40 lambs would be needed to provide bite-size samples for this many visitors.

One of the first problems was, of course, financing. The committee wrote to affiliated members of the Associated Lamb Show and to lamb pools throughout the Willamette Valley, and generous donations for this event were received.

The next step by the purchasing committee was to contact the Hartung Meat Company. Mr. Hartung indicated that he would be able to supply the lambs and make the lamb cuts at a very reasonable cost per pound. Also, he agreed to buy back the racks and short loins, which are the most expensive and least desirable cuts for the type of cooking to be demonstrated. Fifty choice lambs which were fairly heavy in weight and were not excessively finished were purchased.

Cooking the lamb

Klamath Basin lamb producers brought the cooking equipment. Metal watering troughs were skillfully improvised into charcoal grills which could be raised and lowered to regulate the temperature. A huge iron kettle was used to cook the stew, and smaller kettles were used to keep the stew hot.

The big iron stew kettle was known to be over 100 years old and formerly was used for rendering lard. There was an enclosed base under the kettle for the fire. In preparing the lamb, the

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JOHN A. LEFFEL is Washington County Extension Agent and Secretary of the Associated Lamb Shows of Western Oregon.
shoulder, loin, and legs were cut into steaks and chops, and the rest of the meat was trimmed and cut into pieces for the stew kettle. Approximately 500 pounds of lamb went into the stew. The meat was browned in the huge kettle; onion, garlic, wine, and assorted seasonings were added. The meat then was covered and allowed to simmer until tender enough to serve.

**The day's activities**

The remainder of the lamb was cooked as steaks, cut into bite-size pieces, and served on toothpicks to the thousands of people who milled around the mall watching the activity during the day.

All day long, sheepmen and their wives were busy browning lamb steaks and chops and stirring the stew. People in the mall also were given a taste of the stew and recipes using lamb. Numerous questions were asked on methods of preparing lamb and reasons for the wonderful flavor that lamb possesses.

Besides the barbecue theme, two large children's wading pools were filled with ice. Placed in these wading pools were two carcasses of lamb. The various cuts of meat in this display were labeled and were discussed with viewers during the day. Intermittently throughout the day, a bell was sounded and a lucky viewer was presented one of the cuts of meat.

To continue the theme of the patio party, home-sized barbecue units were used to provide ideas for outdoor cookery of lamb at home. Demonstrations were under the able supervision of Betty Ashbaugh, Washington County Extension agent and former representative for the American Sheep Producers Council, and Velma Seat, state Extension marketing specialist. Legs of lamb were boned and butterflied over charcoal; rolled shoulders were cooked on the rotisserie; and lamb riblets were barbecued on the grill. The shiskabobs were of particular interest, and large crowds watched these being prepared and cooked.

**Reactions**

During the day's activity, there was a continual stream of questions. Typical questions were: "What cut is best for shiskabobs?", "How long do you marinate the lamb?", and "How long does it take to cook?" Everyone seemed delighted at the way the lamb tasted, and many mentioned that they did not know that lamb could be so good. Others said that they had never cooked lamb but were going to buy some immediately.

The publicity and promotion work for the Lloyd Center barbecue was conducted by the Pacific National Advertising Company of Portland. The Pacific National Company wrote news stories and furnished pictures to 45 weekly newspapers, 10 dailies, and 6 radio and television stations in the Portland area. This publicity was financed by the American Sheep Producers' Council.
Sheep and Wool Production

LeRoy C. Wright

The history and development of Oregon, particularly east of the Cascades, is closely associated with range livestock. The production of sheep and wool, its history and progress, is closely coordinated with the development of this section of Oregon. Intensification of ranching and farming has had a definite effect on the evolution of sheep and wool production. This procedure has resulted in adjustments involving the entire sheep industry and, in particular, the range phase. The remaining sheepmen still possess the "rugged character" which was so common among their forefathers. However, those in the range sheep business today recognize that they must be more efficient than their forefathers if they are to survive the high costs of ranching. Sheepmen of this type are not going out of the range sheep business.

Number of sheep

At the turn of the century, sheep were numbered in the hundreds of thousands. Today, sheep are numbered in terms of tens of thousands. Sheepmen at the turn of the century owned little, if any, land and were generally nomadic by nature. Their sheep traveled hundreds and, at times, thousands of miles, utilizing forage on the way. The sheep were converting the forage from the range land into the production of wool and lambs. The sheep of today are still performing that important function. However, the range sheepmen now operate from a definite headquarters. Also, the number of sheep has been reduced because of a reduction in the number of ewes required for a grazing permit. These factors have contributed to the fact that the sheepmen now operating in the range areas are more efficient in producing lamb and wool. The sheep have been selected for a high level of wool and lamb production. In most instances, these range sheep are producing at higher levels in terms of pounds of wool and pounds of lamb per ewe than our farm flock sheep.

Range utilization

In many instances, the evolution of the livestock phase of agriculture from forage and range utilization is composed of a coordinated program involving both beef cattle and sheep. At the turn of the century, this type of livestock operation was unheard of. Much of the recorded history of the eastern Oregon area includes statements about the destructive range wars involving cowboys and sheep herders. Since then, research and education has shown us that this unwarranted and vicious competition had little, if any, factual basis. Research has demonstrated that cows and ewes can utilize the forage of an area effectively and efficiently.

The Densley ranch

The operation on the Densley ranch is an excellent illustration of the way results from research and education may be utilized in a livestock program. The Densley name is synonymous with sheep and sheep production. Tom
Densley’s ancestry is recorded in the state of Utah. Tom’s family migrated to Oregon and settled in Baker County, where Tom was born. Tom and Lorraine have achieved their progress with hard work and dedication. In the early development of their present sheep enterprise, they lived in a tent and herded their own sheep. The Densleys are operating a coordinated and correlated range sheep and cow outfit. Their present band of sheep is made up of Columbia crossbred ewes. The wool produced from this range band is $\frac{3}{8}$ blood. The Densley operation is based on marketing crossbred fat lambs and a good quality wool. Suffolk rams are used for the production of crossbred fat lambs. One ram per 50 ewes is the breeding pattern. Replacement yearling ewes are purchased.

**Management practices**

Some of the management practices during the breeding program include a 10-day flushing period for the ewes prior to turning in the bucks. Ten to fifteen percent of the bucks are held back and used as cover rams during the breeding season. This procedure has reduced the length of the lambing season. Lambing starts about March 1 and normally is completed within 20 to 25 days. The winter feed program starts the latter part of December and is in full progress by the first of the year. The Densleys produce their own high quality winter forage from alfalfa grown on their ranch. Two weeks before lambing, each ewe will receive a daily supplement of one-half pound of 16% protein cube.

The lambing facilities include a building equipped with 4 by 6-foot pens or jugs. The ewe band is under strict observation 24 hours a day during the lambing season. This helps to hold the ewe and lamb losses to the very minimum. The effectiveness of this attention is demonstrated by production figures which seldom go below a 150% lamb crop. During the lambing period, the grafting of lambs to different ewes is an important activity. Twin lambs are immediately switched to those ewes which are excellent milkers. This unique practice makes it possible to have twin lambs with the best producing ewes and single lambs with the lower producing ewes. The switching of lambs between ewes is done immediately after a lamb is born.

Summer management includes utilizing forage on private, Bureau of Land Management, and Forest Service lands. Jeep motor equipment is used for camp tending in the lower elevations and pack mules are used in the high elevations. The range areas utilized vary from 3,000 to 9,000 feet in elevation. In the range sheep production, what is known as the “lead band” is the first band of ewes and lambs to move out from the lambing area. This last summer the lambs from this lead band were sold in July. The average weight of these lambs was 108 pounds and 80 to 90% of them graded as fat lambs.

**High quality lambs and wool**

This year the Densleys marketed 147 pounds of lamb per ewe. Less than 15% of all lambs failed to grade as fat lambs and were sold as feeder lambs. All of the lambs from this ranch are sold in the latter part of July or during the month of August.

Shearing of the ewes is scheduled for the 20th of May and is done by contract sheep shearers. Wool production will average from 11 to 12 pounds per ewe. The grade of wool is $\frac{3}{8}$'s blood and, because of its excellent quality, this wool commands a high market price.
A Foot Health Program
J O H N  H.  L A N D E R S

The Oregon Extension Service, in cooperation with four sheep producers in the Willamette Valley, is attempting to demonstrate that foot rot in sheep can be eradicated. The cooperating producers were selected by their county agents, the following criteria were employed for selection: (1) "Did the man wish to cooperate?" and (2) "Did he have a clean area available for the sheep which were trimmed and treated?" The concept of a clean area will be discussed later in more detail.

This project was carried out by two college students under the supervision of Extension animal science specialists and county agents. The foot-trimming cradle used in this study was designed by Mike Huber, Extension agricultural engineer, and constructed by the Department of Agricultural Engineering. The portable foot bath and other equipment for handling sheep were designed from a pattern used by the Department of Veterinary Medicine.

Case No. 1

The first flock of sheep to be treated was located on a ranch in Lane County. On July 6, 7, and 8 the two students put each sheep on this ranch through the chute, trimmed their feet, and put them through a 10% formalin foot bath. Each sheep was marked on the head or back with a crayon to indicate whether it was clean or infected. The clean sheep were placed on a clean pasture. Those sheep that showed evidence of foot rot were put back in the pen.

Nothing further was done to this flock of sheep until July 19, 20, and 21. Again, the feet of each sheep were trimmed and inspected. The clean ewes were put through the inspection table and foot bath before the infected sheep were examined. Then, if the originally clean sheep were found to be infected with foot rot, they were placed with the infected sheep. The so-called clean sheep were moved to a pasture where there had been no sheep for at least three weeks.

A renewed outbreak

As stated before, on first inspection the infected sheep were returned to their original lot. This proved to be one of the downfalls of the project, as all of the infected sheep were more severely infected at the end of three weeks than originally. This lot was essentially bare ground. The sheep's freshly trimmed and treated feet were exposed directly to the dust and foot rot bacteria. This combination resulted in a fabulous case of foot rot in nearly every sheep.

Following the second inspection and treatment, each sheep in the flock, both infected and clean, was put through a 10% formalin solution every four days. The infected sheep were moved from the contaminated lot to a relatively clean pasture, with a minimum amount of exposure to infection.

On August 11 and 12 the sheep were inspected again, and the clean ewes were found to be clean. This represented about 25% of the total flock. The infected sheep were moved through the formalin every three or
four days, and a noticeable improvement in the fleshing of these ewes was evident. It was also evident that much less limping was present in these sheep.

On September 7, the sheep were again inspected and trimmed and the clean sheep were sorted out of the infected group. Approximately half of the 130 infected ewes were found to be free of infection and were held in an observation area before they were put with the clean sheep. The foot bath treatment every three or four days was continued. On September 14 the sheep were reinspected, and the clean sheep were put together. At this point, there were roughly 150 head of ewes in the clean group and about 35 in the infected group of sheep. On September 16 the infected sheep were trimmed and inspected. Of this group, it was determined that approximately 8 ewes had chronic cases of foot rot, which was evident by malformed, misshaped hooves. It was recommended to the owner that these ewes by eliminated from the premises, to alleviate the possibility of contaminating the clean flock. On the remaining number of infected ewes, the foot condition continued to improve.

Case No. 2

Foot rot was found in another flock of commercial and purebred ewes. In this instance, 30 head of supposedly clean ewes had been purchased and incorporated into the ranch operation. The operator held these 30 ewes in isolation for about 3 weeks before allowing them to mix with the other sheep on the ranch. However, the 30 head were not inspected prior to mixing with the other sheep. This operator made a practice of trimming feet at least twice a year, and he also practiced pasture rotation which he felt would help in controlling the infection.

On the first inspection, July 12, approximately 35% of the entire flock showed some signs of poor foot health; however, no sheep were severely infected with foot rot. Of the 30 ewes purchased, 24 had some degree of foot rot. One of the rams that was mated with ewes belonging to 4-H club members showed some sign of foot rot, although the purebreds of this particular flock showed very little, if any, infestation.

The second inspection

Following the initial inspection and trimming, each group of sheep was placed on clean ground where there had been no sheep for at least 14 days. The infected sheep were put through the formalin foot bath on a weekly schedule. On the second inspection, July 26, the hoof had not grown sufficiently to be trimmed the second time. The infected group of sheep were again moved to a clean pasture to prevent any possibility of reinfection. On August 9 another inspection, trimming, and dipping of feet took place. At this point, there were 28 head of ewes in the infected or suspect group of sheep. The weekly foot bath treatment was continued.

On August 26 these sheep were inspected again and only 15 were suspected to be foot rot cases. On September 17 the ewes were trimmed, inspected, and given foot treatments. At this time, only eight ewes were left with any foot trouble. These ewes were considered chronic, and it was recommended that they be slaughtered.

Case No. 3

On the initial inspection of this flock, between 75 and 85% of the ewes were infected with foot rot. Approximately 50 of these ewes had been previously trimmed by the owner. However, he
had not trimmed the feet severely enough to remove all of the diseased area. In addition, no foot bath had been used for the infected sheep following trimming. Upon inspection on August 2, each of these 50 ewes was found to be severely infected with foot rot. The feet were deformed and extremely soft. Nearly all of the hard shell of the foot had to be removed from each of these sheep. In all instances, these sheep were made to stand in a 10% formalin solution for at least five minutes.

The remainder of the flock was inspected, trimmed, and treated with formalin. Approximately 50% of these ewes were infected to some degree. Many of these infected ewes did not show any signs of limping.

**Progress noted**

All of the clean ewes were removed to a clean area where no sheep had been for approximately a month, and all of the infected sheep were moved to a large pasture where the probabilities of reinfestation were quite low. The owner agreed to put all of the infected ewes through the formalin foot bath at least twice a week.

On August 18 the infected group of ewes was inspected, trimmed, and dipped, and those ewes judged to be free of foot rot (approximately 30 head) were moved to the clean pasture with the clean group of ewes.

On September 20 the sheep were reinspected and trimmed. At this point, approximately 160 head of ewes were in the clean group and free of any foot rot; approximately 40 head of ewes still were infected with foot rot. Following this inspection, the infected group was moved through the foot bath on a weekly basis.

**Minimum requirements for foot health**

1. Set up handling facilities including a holding pen, chutes, foot trimming table, water, and a foot bath. The foot bath could be made of ¼-inch marine grade plywood glued together. Cleats in the bottom of the trough will help to support the walls. Two foot baths, 8 feet long, are desirable.

2. Provide two clean pastures, initially, where no sheep have been for at least 21 days, and two additional pastures where sheep can be moved for the second inspection. Clean pastures are a necessity after each trimming. The foot rot organism will not live more than 14 days unless it is on sheep.

3. Put all sheep through the foot bath of 10% formalin at least twice a week. The 10% formalin solution is made by using nine parts water and one part of 38% formaldehyde. If the weather is hot, the foot bath should be placed in the shade to prevent rapid evaporation of the formaldehyde. The feet should be trimmed at about three-week intervals.

4. Quarantine all flock additions for at least 30 days to prevent introduction of foot rot onto the premises. Each new sheep should have its feet trimmed and should be put through the foot bath as a precautionary measure. The feet should be inspected again prior to the time of mixing these sheep with the clean flock.

5. Sell for slaughter all sheep that have chronic cases of foot rot.
Buildings and equipment for raising sheep need not be expensive. However, they should meet the needs for good management practices and also for the particular type of sheep operation. Shelter for ewes and lambs is desirable in most areas for early spring lambing. Protection from the elements will help in maintaining a high survival rate for newborn lambs. Low-cost buildings of pole-type construction are being used in many areas. Temporary building frames covered with plastic sheeting will provide sufficient protection from rain and wind. In permanent pole-type buildings, the poles should be pressure treated with or soaked in a wood preservative according to recommendations available from Oregon State University.

Cedar and other woods that do not decay rapidly might be suitable for use in temporary shelters or buildings which are not expected to last many years. In the Willamette Valley, many sheepmen are using a portable, sled-type shelter. Because of the sled-type base on the shelter, it may be moved from one pasture to another. Sometimes a creep feeder is set up inside this portable shelter.

Other equipment

Heat may be desirable to help dry newborn lambs and a heat lamp is ideal for this purpose. However, when heat lamps are used, care must be taken to use them in accordance with electrical codes. A porcelain lamp socket must be used. The lamp should not be suspended by the electric cord but by a separate rope or chain. This type of heat lamp equipment can be bought at any farm hardware store.

There are various kinds of sheep feeder plans and also many ideas on what constitutes a good sheep feeder. Self-feeders may be used for feeding grain or pellets, and some feeders are designed for feeding chopped hay.

Some of the sheep sheds or buildings can have multiple use. For example, a lambing shed may be converted into a shearing shed by the use of portable floor sections. Movable slatted floors are desirable to help keep the animals clean while confined for shearing. However, well-drained dirt floors are satisfactory for sheds and feeding pens.

Cutting chutes

For small or large numbers of sheep, a cutting chute conveniently located near the shearing shed is desirable. The chute should be 15 inches wide, constructed of solid boards, and high enough so the sheep cannot jump out. Sheep generally are easier to handle when they are going uphill, and it would be desirable to have an upgrade chute. The chute and all doors, gates, corrals, and sheds should be large enough for pregnant ewes to go through without injury. A good cutting chute greatly facilitates the handling and sorting of sheep and lambs.

Most sheep growers find a sheep corral convenient for handling sheep during the shearing, lambing, market-
ing, and weighing operations. Very few plans are available on what type of corral setup is the most efficient.

Foot rot is prevalent in most heavy rainfall areas along the western slope of the Cascades. Equipment for holding sheep while trimming the feet is desirable for a successful control program. Oregon State University has plans for a cradle or chair for holding sheep while trimming the feet. Also, in the experimental stage of development is a sheep squeeze that has been successfully used in trimming feet for the control of foot rot.

Various plans for sheep equipment are available from the Oregon State Farm Building Plan Service, Agricultural Engineering Building, Corvallis, Oregon 97331.