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Rotation of animals from pasture to pasture is not always effective as a control for stomach worms. Previously, it was believed that if animals could be kept off a pasture for one month enough worm larvae would die to prevent lambs from acquiring severe parasite burdens the next time they grazed the area. Recent research on this subject indicates that even if an infested pasture is rested for 48 days, enough worm larvae may survive to produce acute parasitism in lambs.

There are still some questions to be answered regarding the value of rotation as related to parasite control. The decision to rotate pastures is one for the producer to make as an integral part of his management program.
Control of Stomach Worms in Sheep

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Heavy economic losses may be caused by stomach-worm infections in sheep. Although few animals die, many become unthrifty and waste large amounts of feed. In certain parts of Oregon farm flocks on irrigated pastures provide extremely favorable conditions for worm development.

This circular answers some of the most common questions asked about stomach worms in sheep. Additional information can be obtained from your county agent.

What are sheep stomach worms?

Stomach worms are roundworms (nematodes) which spend part of their lives in the fourth stomach of sheep. Three types of parasites are known to cause problems. These are the eastern stomach worm (barber’s pole worm), the medium stomach worm (western or brown stomach worm), and the stomach hairworm.

How do sheep become infected with stomach worms?

Adult worms, living in the stomach, lay eggs which are passed in the droppings. Under suitable conditions—adequate heat and moisture—the eggs hatch and the immature worms crawl onto surrounding vegetation. Sheep become parasitized by grazing on forage containing young worms. These worms pass to the fourth stomach and mature, and the life cycle is repeated.

What is the strategic time for drenching?

Drenching before the effects of severe parasitism occur is good preventive medicine. Selection of the best date for treatment is difficult since conditions vary from farm to farm, and year to year. However, we know that an increase in the parasite population may be expected in young animals at times when pastures are overcrowded or overgrazed, and after heavy warm rains. These conditions are most important in parasite control when dealing with farm flocks rather than range animals and they must be determined “on the spot.”

Under farm flock conditions ewes and rams should be drenched during the late fall or early winter, preferably during November in western Oregon. Lambs should be drenched during the spring, in April or May. Following a mild winter, earlier drenching is advised for animals born in January and February. Animals carried over through the summer should be drenched in July, especially if they are highly concentrated and grazing short forage. It is advisable to drench feeder lambs before placing them in a feed lot.

Reliable drug manufacturers and distributors provide accurate treatment instructions with their products.

What effect does nutrition have on parasitism?

A high level of nutrition will modify the effects of parasitism. It will not reduce the total worm burden. Also, good forage accompanied by adequate pasture will provide enough feed so that animals will not graze close to the soil where a majority of the infective larvae are found.

How are pasture rotation, overstocking, and overcrowding related to stomach worm control?

Overstocking and overcrowding lead directly to increased numbers of infective larvae on the pasture. Therefore, animals’ chances of
that new compounds, more effective than phenothiazine, will be produced, but they will still be ineffective if used improperly.

**What about the use of phenothiazine in the salt or by low level administration?**

First it is necessary to differentiate between these terms. Low level administration refers to dosing animals with small quantities of the drug in their feed for a restricted period of time. By this process an amount of phenothiazine similar to that used in a drench can be given without handling the animals. This practice is frequently used with cattle and horses. Phenothiazine may also be administered continuously in small quantities by mixing it with the salt. The principle behind this type of treatment is quite sound. Not enough phenothiazine will be given to kill mature worms, but small quantities passing through the sheep’s intestines will kill larvae that hatch from the worm eggs.

There are several complications associated with phenothiazine-salt treatment. Some animals will not eat this mixture and, consequently, may never be treated. It is easy to run short of material and, for a time, some sheep may produce enough worm larvae to cause serious losses, especially in susceptible animals. Most important, however, is the fact that the worms may develop resistance to phenothiazine. This is quite similar to DDT resistance in houseflies. Research in several states has indicated that phenothiazine is of little value because of a highly developed level of resistance.

There are indications that some resistance to phenothiazine is occurring in Oregon. To preserve the effectiveness of this drug as a drench, it is advised that phenothiazine-salt mixtures be used only when no other means of treatment is available.

**What is the distribution of stomach worms in Oregon?**

Since few detailed surveys have been made in Oregon, our present information is incomplete. Eastern stomach worms seem to be common in the Willamette Valley and less common in areas having a low annual rainfall. Medium stomach worms and stomach hairworms have been observed in sheep from all parts of the state, although hairworms do not seem to be as common in the Willamette Valley as in southern Oregon. The immature forms of both of these species are more resistant to extreme weather changes than eastern stomach worms.

**What effect do these parasites have on sheep?**

The effects are varied and complex and depend on a number of conditions. Eastern stomach worms may cause anemia (loss of blood) and loss of weight. Deaths from eastern stomach-worm infections are not uncommon but most economic losses occur when lambs fail to fatten properly. Old and young animals are highly susceptible to parasitism. Medium stomach worms and hairworms may cause loss of weight and scours, but the clinical picture is not as severe as that produced by eastern stomach worms. Infection with only one of these worms is uncommon.
When do stomach worms cause the greatest problem in sheep?

Stomach worms usually cause the most trouble in the late spring or midsummer. Mature sheep in good condition and on a high level of nutrition seem to show the least effect from parasitism, even though they may be carrying several hundred parasites. During late winter and early spring, worm eggs accumulate on pastures. As weather conditions become milder, the hatching rate of these ova increases.

By the time lambs are two or three months old, there are frequently enough immature parasites on the pasture to provide a uniform infection. From then on worm loads may increase until severe parasitism occurs. If this is not checked, the added burden of several thousand worms may be enough to interfere markedly with production efficiency.

Again in midsummer and possibly in early fall, worm burdens may increase to dangerous levels because of overgrazing of pastures and favorable climatic conditions for nematode development.

What can be done to gain effective control of stomach worms?

Understand what is happening—the method by which sheep become infected with worms as related to seasonal changes and management practice. Don’t rely on a once-a-year drug treatment program administered at some pre-set date. Treatment should be geared to parasite numbers, which vary from year to year. Recognize that preventive treatment with drugs is superior to treatment after symptoms of parasitism have been observed. Use only drugs that have been proved safe, economical, and effective.

Treat ewes and rams during late fall or early winter, when the parasite population is subsiding. This will help prevent an accumulation of immature infective-stage larvae in the spring when the sheep population is highest and susceptible lambs are present.

Drench lambs after they have become parasitized but before they show signs of parasitism. This is recommended over treatment either before they become infected or after they have lost condition. (See page 7.) Retreat again in midsummer or early fall, since these are the times when conditions for parasitism are most favorable.

What drugs should be used for control?

Currently, phenothiazine is the drug of choice. It should be used in a fine particle form (indicated on label) as this form has been shown to be more effective than standard phenothiazine. Also, a “purified” form of fine-particle phenothiazine has proved quite effective. Copper sulfate-nicotine sulfate (CuNic) mixture is still effective in certain cases but copper sulfate is quite toxic to sheep and the margin of safety is small. Phenothiazine also may be toxic to sheep, but few poisoning cases have been reported. In addition, several research reports have indicated that phenothiazine is safe to use on pregnant ewes just prior to lambing if they are handled gently.

Have any of the systemic chemicals been approved for use in controlling sheep stomach worms?

Systemic chemicals are those which enter the animal’s circulatory system and are carried to all parts of the body. So far none of these have been released for use. Several are being tested in field trials and some have been approved by the United States Department of Agriculture for controlling other types of parasites such as bots and grubs. It is quite possible
that new compounds, more effective than phenothiazine, will be produced, but they will still be ineffective if used improperly.

**What about the use of phenothiazine in the salt or by low level administration?**

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