Using Chemicals in Combating Internal Parasites of Sheep

By
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THE loss of sheep, lambs, wool and the effects of stunting from parasitism cause a serious drain on the sheep industry in all countries. It is the purpose of this report to describe e use of some of the chemicals found effective in combating rasites in North Dakota and other parts of the country. One ust consider that the various types of parasites are not likely to completely eliminated by use of all the means at our disposal d that constant vigilance is necessary in order to keep the rasites at the lowest possible number.

Before an effective and logical plan of procedure can be ected against sheep parasites it is necessary to know the paraes involved in each flock. We have indicated in an earlier pubation (1) the probable types of parasites that would be found western Minnesota and in North Dakota. There appears to be simple drug that will completely eliminate all types of paraes with a single treatment and the problem of reinfestation is ways present.

This report summarizes some of the methods that have been und effective in ridding sheep of most of the various types of rms and also includes various general methods of combating l types of internal parasites.

Ne y parasite control program, if it is to be effective, must e use of all available knowledge about each and every para- that is causing trouble in the particular flock.

Whenever there is evidence of rasitism the most effective and iversally recommended attack on e problem is to improve the sanion. Decrease the rate of infecn by pasture rotation, by use of itary drinking troughs, by reading the flock over a wider ea and by removing manure piles d fencing sloughs.

The next important step is to sure an adequate feed supply. is must include water, minerals, mmon salt, and roughage and if ssible a grain supplement. Keep the sheep in a gaining condition if at all possible.

Measures directed against the spread of parasites should also include the use of a 1:9 mixture of phenothiazine and granular salt fed during the entire grazing season.

The next and perhaps the most important step is to have the parasites identified. In general the early season losses are due to the large stomach worm, **Haemonchus contortus,** the midsummer losses are due to the small stomach worm, **Ostertagia circumcincta,** and the

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scours of later summer and fall is due to the bankrupt worms, Trichostrongyles sp. During the summer and early fall the tapeworms, both the broad, Moniezia, and the fringed, Thysonosoma, may also cause scouring and loss of condition. A specific type of treatment must be directed against each of these parasites.

The large stomach worm causes anemia, scours, emaciation and when rapid, heavy infestation is taking place, may kill fat lambs before any symptoms develop. Either the standard cunic* mixture or phenothiazine is satisfactory to combat this worm. When this parasite is prevalent the treatments should be spaced at three week intervals and phenothiazine and salt fed. Treatment of the ewes before the pasture season is one of the most effective means of combating this worm.

The small stomach worm, Ostertagia, does not kill as many lambs as does the large stomach worm but it causes stunting and the production of unthrifty lambs. Both phenothiazine and the cunic mixture are partially effective against this worm although neither is entirely satisfactory. The arsenic containing anthelmintics have in general been more effective against this parasite than any of the other drugs. The phenothiazine and salt mixture tends to inhibit egg production by this worm and many of the ova deposited are not viable. They may develop to various stages but they frequently do not become infective.

The small stomach and intestinal worms of the Trichostrongyles group are by far the most difficult of the roundworms to eliminate. Some of them are killed by all of the above discussed anthelmintics but none of them are completely effective. Tetrachlorethylene kills large numbers of these worms but under some conditions this drug is highly toxic and causes heavy death losses of sheep. The phenothiazine salt mixture tends to decrease the rate of ova production and its use is to be recommended however, in heavy infestation these parasites continue to increase in numbers and cause scouring and loss of weight even though phenothiazine is used with salt or as a drench.

The broad tapeworm, Moniezia, is readily killed by arsenic compounds. The cunic mixture is partially effective but phenothiazine is of no value in controlling this parasite. Lead arsenate and kamala are two drugs used quite successfully in controlling this flat worm.

The fringed tapeworm, Thysonosoma, is frequently located in the gall-bladder or bile ducts and is quite difficult to remove. Both the cunic mixture and the arsenic containing drugs are partially effective against this parasite.

Sheep parasites can be controlled by proper management practices and by use of the most effective drugs at the proper times. Most failures in parasite control are the result of using the wrong drug or from depending entirely on one or two treatments when sheep are on badly contaminated soil. It appears possible to combine the various anthelmintic drugs into a mixture that may be effective when used at proper intervals to control all of the gastrointestinal parasites of sheep.

We have recently described (2) a drug mixture that is very efficient in eliminating all of the worms usually found in the stomach of sheep as well as most of the tapeworms. This mixture also appears to be as effective as tetrachlorethylene against the Trichostrongyles. The mixture contains copper sulfate, nicotine, arsenic and phenothiazine in an alkaline base containing wetting and suspending materials when it is to be administered as a drench.

The dry powdered alkaline anthelmintic can be mixed with

*Common name for the standard copper sulfate-nicotine sulfate drench.

grain to be fed to sheep under feedlot conditions, although this type of medication is not as effective as individual treatment.

All worm remedies are composed of poisonous materials. The alkaline anthelmintic contains sufficient arsenic to be highly toxic when improperly administered or when given in excessive amounts. It is advised that sheep be treated with this medicine only on the advice of a veterinarian. Under no circumstances should an arsenic containing anthelmintic be given to badly scouring lambs or to ewes in advanced pregnancy. When severe gastro-enteritis is present there is an increase in the rate of absorption of copper, arsenic and nicotine and poisoning may result. Losses will be held much lower if sheep are treated before they become too weak from parasitism to withstand the effects of the treatments instituted. If scouring is very severe in a flock, it is advised to put sheep on dry feed with a grain supplement and to administer minimum doses of the anthelmintic chosen. After scouring stops, the standard dose should be given to the entire flock.

Bibliography

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Effectiveness of DDT Against Potato Insects

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PRELIMINARY tests conducted in 1944 by the North Dakota Agricultural Experiment Station with a 5 percent DDT-Copper dusting mixture indicated this insecticide to be superior to other treatments including an arsenical, copper lime dust, DN-Copper dust, Dithane, and Sabadilla-copper dust. Two applications were made, July 12 and July 22 respectively, at the rate of about 20 pounds of dust per acre per application. The treatments were replicated in plots twice. Yield data were obtained by digging 30 hills of tubers in three separate locations in each of the replicated plots. The field was located near Fargo. The results are summarized as follows:

Where copper was used it was applied at the rate of two pounds copper (metallic basis) per acre. An arsenical was dusted on all plots except where DDT was applied.

Treatment	Yield computed on per acre basis
Arsenical only	160 Bushels
Copper-lime dust	166.1 Bushels
DN dust and copper	166.5 Bushels
Dithane	169.7 Bushels
Sabadilla and copper	173.4 Bushels
DDT 5 percent and copper	174.4 Bushels

Abbreviations:
Dithane=(Disodium-ethylene-bisdithiocarbamate)
DN=(Dinitro)
DDT=(Dichloro-diphenyl-trichloroethane)

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