Parasites of Sheep and Deer

mutual parasites of domestic sheep and Columbian black-tailed deer studied for transference factors

William M. Longhurst, James R. Douglas, and Norman F. Baker

Similar foraging habits of sheep and deer provide ample opportunity for transference of mutual parasites.

Field and autopsy data obtained in a study of sheep and deer primarily at the Hopland Field Station, in southeastern Mendocino County, indicated that of the several kinds of parasites found, roundworms infecting the abomasum or fourth stomach, the small intestine, and the lungs had the most serious effects on the host animals.

From examinations of 98 sheep and 129 deer—in the study—45 kinds of parasites were identified, with 21 species common to both animals. The parasites included one protozoan, one fluke, five tapeworms, 22 roundworms, two lice, six flies, one flea, five ticks, and two mites.

Roundworms belonging to the genera Ostertagia, Trichostrongylus, and Dictyocaulus were considered to be the most important forms involved.

Living together as they do in close association on the range and with quite similar foraging habits, it is logical that sheep and deer should be exposed to many of the same parasites.

Generally, sheep foraged more on grass than did deer, but both animals fed almost exclusively on grass and herbs from November—when fall rains brought up the new growth—until mid-April. This was the period of maximum nematode transference and it was likewise during this time that deer particularly deteriorated in condition and suffered heaviest losses—amounting to nearly 40% of the herd during the winter of 1951–52.

Sheep losses were not abnormal for this section of the country even though the winter of 1951–52 was above average in severity. During this winter, for example, in one pasture of some 570 acres—with virtually no available browse—both sheep and deer subsisted almost entirely on grass and herbaceous forage, without supplementary feed. Nevertheless, a flock of 95 head of yearling rams came through the winter in relatively good condition and progressively increased their fat reserves.

On the other hand, 12 deer carcasses were found, although this was not an area where carcasses were particularly concentrated.

Sheep were given supplements of cot-
Root Fumigation

carrot and beet roots used in tests for nematode control

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For each treatment, two matched lots of 20 carrot roots per lot and two matched lots of 25 beet roots per lot were used. After treatment one lot was planted in a Yolo heavy clay loam, and the second in a Yolo fine sandy loam. The table lists the treatments and contains the data obtained on survival in the field. The data from the two field lots for each treatment were combined since there was almost no difference in results between the two fields. The relatively poor survival of the carrot check plots was due to root decay which started in the period between digging and the experimental treatments and which affected all treatments equally. The survival results indicate that the following treatments would be the maximum that might be safe:

<table>
<thead>
<tr>
<th>Treatment Rate</th>
<th>Survived Plants Which Carrots Beetts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapor heat . .</td>
<td>110°F, 2 hr.</td>
</tr>
<tr>
<td>Ethylene dibromide</td>
<td>1 lb. 2 hr.</td>
</tr>
<tr>
<td>Methyl bromide</td>
<td>2 lbs. 2 hr.</td>
</tr>
<tr>
<td>Ethylene chlorobromide</td>
<td>8 lbs. 2 hr.</td>
</tr>
</tbody>
</table>

Of the beet roots that survived any of the treatments, only 74.7% produced seed stalks compared to 90% of the beets in the check plots. Thus the treatments converted some beet roots back to a vegetative state. All carrot roots produced seed stalks.

PARASITES

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Lambs raised under worm-free conditions were successfully infected with six species of stomach and intestinal worms cultured from deer feces.

To some extent, parasites appear to exhibit a correlation both in their numbers and in their effects with the physical condition of the host. This effect is most likely to be influenced by nutrition of the host. Nutritional status in turn is largely determined by the availability of food and bodily demands for maintenance, growth, and reproduction. Young animals—because of the demand on their nutritive intake for growth—are in a relatively poor position to withstand attacks by parasites. Both sheep and deer were found to build up resistance to worms after exposure so that animals past their first year generally carried only a small worm burden.

Parasitism under these range conditions can probably be best attacked by improving range management practices, with stocking rates being one of foremost importance.

Chemical control of nematodes in sheep can be effective, however. Successful control with phenothiazine—the most effective agent—includes therapeutic doses given as a drench or pellet according to body weight, as well as prophylactic doses in a salt mixture. Obviously such a program is not practical for deer. On the other hand, it is probable that a reduction of nematodes in the sheep flock would be of indirect benefit to deer in that the rate of infection would be lowered. By the same token, reducing the incidence of roundworms in deer would benefit the sheep.

Nematode transference between sheep and deer is primarily a problem of the north coastal section of the State. There large numbers of both of these animals share common range, and conditions of moisture, temperature, and vegetation make it possible for the worms to complete their life cycle.

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