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Injectable Famphur for Control of Grubs in Cattle

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Grubs are a major pest of cattle and cause considerable economic loss to the cattle industry. Running of cattle and standing in available water sources during heel fly strikes no doubt are reflected in lighter weaning weights of calves because of reduced grazing time and cows becoming separated from their calves. Other losses to producers and feeders include possible reduced feedlot performance by grub infested animals, weight loss and down grading of carcasses that are trimmed to remove areas damaged by grubs and a lower value for hides due to grub holes. Several effective products and methods of treatment are available for control of grubs. Timely administration of a proper dosage to all animals from problem areas is necessary for effective control.

In the mid 1950's, organophosphates were discovered to be systemically effective against grubs. Following hatching from eggs of the heel fly laid on hair of the legs, the larva migrate through the tissues during a period of about 8 months to encyst in the backs of cattle. These materials killed the developing larva in the animal body during this period. Several organophosphates were found to be effective in killing grubs, but in some animals toxicity was encountered. Precise dosage and time of year were found to be important in effectiveness of grub control and in lessening of toxic symptoms. Several methods of administration of these products have been developed for ease of application under various conditions of the facilities and management practices.

A high-pressure spray using about 400 psi is effective in controlling grubs. The animals should be thoroughly wetted for maximum effectiveness. Cattle sprayed after the egg laying season for the heel fly is over or treated in late July, August or early September are also benefited by fly and louse control. Holding corrals for spraying cattle should be small enough so all animals may be thoroughly wetted with minimum amount of material.

Pour-on treatments with grubicides are effective against grubs and horn flies and to a lesser extent against lice. Pour-on treatments necessitate a single-file arrangement for individual treatment of all the cattle. It is almost a necessity for each animal to stand still long enough to be treated with a measured amount of material.

Feed additives, whether in the feed, a supplement or a free-choice mineral mix, are effective if each animal consumes an adequate amount of the product each day. The problem with this method is obtaining uniform and adequate consumption of the treatment material by all animals. This system of treatment has also been used in horn fly control as well as control of grubs.

A large pill or bolus has been used in control of grubs. The size of the bolus and difficulty in administering to calves have tended to discourage this method of treatment.

An injectable grubicide has been in the experimental stage for some time. It is a positive way of treatment in that a precise dosage can be administered to each animal. Like the pour-on treatment, it requires a single file arrangement and momentarily stopping each animal but not necessarily restraining the animals. The neck or rump are convenient places to inject the product.

The organophosphates can be administered after the egg laying season of the heel fly is over and as late as November. Treatment is not recommended from December through March as a toxic reaction may be encountered when grubs are killed in late stages of their life cycle. Dates for treatment vary with geographical location, being later with cattle raised in northern areas.

Increased weight gains from treatment for control of grubs have been added incentives for the treatments. Many instances of improved weight gains have been reported from treatments for grub control in comparison to only a few of reduced gains.

An injectable organophosphate (Warbex, famphur) was tested in the experiment reported here for its effectiveness in control of grubs and its effect on feedlot performance of the animals. Calves not previously treated for control of grubs were used in the experiment.

Procedure

Steer calves used in this experiment were obtained through a cattle auction. All had been raised on the same ranch. One hundred forty-four (108 Hereford x Angus and 36 Angus) were selected for the experiment. Within one week of arrival, the calves were allotted into 24 pens of 6 each on basis of weight within breed groups. The initial filled weight on experiment was about 360 lb. which was nearly the same as the purchase weight. The steers had previously received vaccinations commonly associated with preconditioning treatments and no additional ones were administered except blackleg. They were implanted with 36 mg zeranol per head near the beginning of the experiment.

The experimental rations were a full feed of corn silage and one of six supplement treatments. The supplements were formulated to compare levels and sources (soybean meal and urea) of protein supplementation during the initial 4-week feedlot adaptation and during later growing and finishing. Four pens of calves received each of the six supplement treatments.

The corn silage fed for the first 80 days of the experiment was low yielding with a small amount of grain (estimate of 20 to 30 bushels per acre) because of dry weather during the growing season. It was harvested in a dry condition because of an early frost. Dry matter of samples taken at approximately weekly intervals during the experiment averaged 44.8% with a protein content of 9.63% on a dry basis. That fed for the remainder of the 138-day experiment was from irrigated corn. While it was well-eared, yield was also reduced somewhat by the early frost. Average dry matter content was 51.7% with 8.67% protein on a dry basis.

Soybean meal or urea supplements were fed to 30 pens of the cattle and were formulated to contain about 32% protein on an as fed basis. A corn-based supplement was fed to six pens of the cattle and contained the same levels of minerals, vitamin A and other additives as the soybean meal and urea supplements.

Injectable famphur was tested in the experiment for its effectiveness in control of cattle grubs and its effect on feedlot performance of the calves. Treatment levels of the product were 0 (control), 1, 2 or 3 cc per 100 lb. of body weight. These levels provided 7.7, 15.4 and 23.1 mg of famphur per kg of body weight, respectively. All calves within a treatment group were injected with the same level of the product. Levels used were 4, 8 or 12 cc per head. Injections were given intramuscularly either in the neck or rump 8 days after beginning of the feeding experiment.

Treatments for grub control were balanced as to ration treatments resulting in 6 pens of 6 calves each within each grub treatment group. Animals were observed closely for several days for evidence of toxicity and for swelling or tissue damage at sites of injection. The backs of the cattle were palpated on three occasions (March 4, March 21 and April 17) to detect presence of grubs.

The cattle were weighed periodically during the experiment and feeds offered were recorded for use in determining effects of the grub control treatments on feedlot performance. The experiment was terminated after 138 days.

Results

Grub Control

Observations made during the first several days of the experiment resulted in no evidence of toxicity from the product or any swelling or tissue damage at site of injection. The weather for the first 4 days following injections was mostly clear and cool with no measurable precipitation. No disease problems were encountered.

Results showing the effects of treatment levels of the grubicide on grub counts on various dates are shown in table 1. Appearance of grubs in the backs was rather late in this group of cattle. By March 4, 20 of the 36 control animals had detectable grubs. None of the treated animals had detectable grubs on this date.

Palpation on March 21 revealed that 34 of the 36 control calves were infested with grubs. The counts ranged from 2 to 29 with an average of 8.1 grubs per infested animal. A total of three grubs was detected in two calves on this date when treated with 1 cc of famphur per 100 lb. of body weight. These three grubs compared to a total of 277 in the control group (98.9% control). No calves showed evidence of grubs in the group treated with 2 cc of the grubicide per 100 lb. of body weight. Only one grub was detected in the calves treated with 3 cc of the product per 100 lb. of body weight.

Number of grubs in the control group had increased to 335 at the last palpation on April 17 with still 34 of the 36 calves being infested, average of 9.9 grubs per infested animal. There were only two grubs detected in the 1 cc treatment group at this time (99.4% control). There were no grubs detected in the 2 cc treatment group. The one grub detected at the March 21 palpation was not detected on April 17 in the group injected with 3 cc of famphur per 100 lb. of body weight. Apparently, the grub had emerged by this date or the earlier detection was in error. The grubs were not extracted

during the experiment, but there was evidence of emergence as indicated by the range in grubs for infested animals on April 17 in comparison to the range on March 21.

Feedlot Performance

Results of feedlot performance are presented in table 2. Rate of gain was at a slightly higher rate over controls for all treated groups, amounting to an average of 0.11 lb. daily (6.1%). Feed consumption varied only to a small degree between treatment groups. Those treated for control of grubs required 4.9% less feed per unit of gain than untreated controls.

Summary

Results of this experiment showed no evidence of toxicity or tissue damage at site of injection when calves weighing about 360 lb. were injected intramuscularly with 4, 8 or 12 cc of famphur per animal (approximately 1, 2 or 3 cc per 100 lb. of body weight). Injections were made on November 21, 8 days after beginning the feeding experiment.

Thirty-four of the 36 control calves were infested with grubs when palpations were made on March 21 and April 17. Total counts on these dates were 277 and 335 for an average number of 8.1 and 9.9 grubs per infested animal.

Three grubs were found in two calves treated with 4 cc of the grubicide on March 21 (98.9% control) and two on April 17 (99.4% control).

No grubs were detected in calves treated with 8 cc of famphur. One grub was recorded in one calf on March 21 when treated with 12 cc of the product but not detected at the later palpation.

Weight gains were slightly higher for calves treated for control of grubs. Average improvement amounted to 0.11 lb. daily (6.1%) with only small differences between treated groups. Feed intake was about the same between treatment groups. Those injected with famphur averaged 4.9% less feed per unit of gain than for controls.

The results indicate that injectable famphur at all levels used is highly effective in control of grubs in cattle with a slight improvement in weight gain and feed efficiency. Levels up to 3 cc per 100 lb. of body weight appeared to result in no signs of toxicity or tissue damage at site of injection.

Table 1. Grub Control in Cattle with Injectable Famphur
(November 13 to April 2, 1975--138 days)

	Famphur treatment, cc/100 lb. body wt.			
	0	1	2	3
Number of steers	36	36	36	36
Number with grubs at dates of palpation				
March 4	20	0	0	0
March 21	34	2	0	1
April 17	34	2	0	0
Total number of grubs				
March 4	78	0	0	0
March 21	277	3	0	1
April 17	335	2	0	0
Avg. number for infested animals				
March 4	3.9	--	--	
March 21	8.1	1.5	--	1.0
April 17	9.9	1.0	--	
Range for infested animals				
March 4	1-12	0	0	0
March 21	2-29	1-2	0	1
April 17	1-22	1	0	0
Percent control				
March 4	--	100	100	100
March 21	--	98.9	100	99.6
April 17	--	99.4	100	100

Table 2. Feedlot Performance of Cattle Treated with Injectable Famphur for Grub Control
(November 13 to April 2, 1975--138 days)

	Famphur treatment, cc/100 lb. body wt.			
	0	1	2	3
Number of animals	36	36	36	35
Avg. init. shrunk wt., lb.	349	348	347	347
Avg. final shrunk wt., lb.	598	610	615	610
Avg. gain, lb.	249	262	268	263
Avg. daily gain, lb.	1.81	1.90	1.94	1.91
Avg. daily ration, lb.				
Corn silage	22.24	22.51	22.91	22.34
Supplement	2.27	2.27	2.28	2.27
Total	24.51	24.78	25.19	24.61
Feed/100 lb. gain, lb.				
Corn silage	1240	1185	1186	1171
Supplement	127	120	118	119
Total	1367	1305	1304	1290