

produce a pellet containing 40 percent protein with one-third of the nitrogen furnished by urea. However, the addition of trace minerals to the urea-containing pellet results in increased gains indicating increased utilization. Prairie hay apparently furnishes nutrients not present in dry range grass, because the addition of trace minerals to a urea-containing pellet fed as a supplement to prairie hay did not result in increased gains. These results are in agreement with the results of previous tests and indicate that considerable attention must be given to trace minerals and nutrients furnished by a small quantity of dehydrated alfalfa meal when formulating supplements containing urea.

Grub Control with Dow ET-57, A Recently Developed Systemic Insecticide¹

D. E. HOWELL

Estimates of the losses caused by cattle grubs in the United States vary from \$100 million to \$300 million annually. The loss in Oklahoma approaches \$12 million. Current control measures for this serious pest require at least three applications of rotenone as a spray, wash or dust at monthly intervals from December to March. Unfortunately, much of the damage has been done by the grubs before control can be accomplished with rotenone as it is effective only after the grubs have cut through the hide late in their larval life. Phenothiazine was reported to be effective in controlling grubs and internal parasites by low level feeding but extensive tests at this Station indicated it did not provide appreciable grub control. Preliminary results in 1955-56 with a newly developed organic phosphate systemic were so encouraging that large-scale cooperative tests were established in several parts of the State.

The insecticide used was developed by the Dow Chemical Company and formulated as a drench, bolus (elongated pill) or capsule. Chemically the material is O,O-dimethyl O-2, 4, 5-trichlorophenyl phosphorothioate commonly called Dow ET-57. It was used at the rate of approximately 100 mg./kg., roughly 1.6 oz. of pure material for a thousand pound cow. The insecticide was given before the grubs had appeared in the backs of the cattle.

Grub control tests involving 1,498 animals were superimposed on genetics, feeding, or management experiments at Stillwater, Lake Carl Blackwell, Fort Reno, Fort Supply, and Coalgate by treating half of each group. The other half was left untreated as a check. A test under ranch conditions was carried on with the cooperation of the Codding brothers at Foraker, Oklahoma.

The effectiveness of the insecticide was determined by comparing the number of grubs in the backs of treated animals with those in the untreated group at monthly intervals during the grub season.

¹ This cooperative work involved the Oklahoma A & M College Departments of Agronomy, Animal Husbandry, and Entomology; Ft. Reno and Southern Great Plains Field Station Range Unit at Fort Supply.

A summarization of the results is shown in Table 1. The control obtained was not significantly affected by the age of the animals, calving, location in the State, or the formulation of Dow ET-57 used. Control in individual lots varied from 92 to 50 percent and averaged 76 percent for the 1,498 animals.

Minor toxicity was noted in only one group of 24 feed lot steers where some scouring was evident for several days after treatment. In all other cases no evidence of adverse effects were seen, even though the animals were treated immediately before or after calving.

Dow ET-57 is still an experimental material and is not available for commercial use yet. It should be used on beef cattle only, as small amounts of the insecticide appear in the milk for several days after treatment.

Table 1.—Summarization of cattle grub tests with Dow ET-57

Location	Age of Animals	Formulation	Animals in Test		Ave. No. of Grubs/Animal	
			Treated	Un-treated	Treated	Un-treated
Fort Supply	Yearlings	Capsules	42	42	2.1	21.9
Fort Supply	Mature Cows	Capsules	44	44	1.3	16.3
Fort Reno	Mature Cows	Drench	76	75	3.4	8.9
Fort Reno	Mature Cows	Drench	49	47	1.3	6.5
Fort Reno	2 yr. Heifers	Drench	16	17	3.6	15.2
Fort Reno	Yearlings	Drench	19	18	3.1	10.8
Fort Reno	Calves	Drench	24	25	2.5	19.5
Coalgate	Yearlings	Drench	10	9	10.5	31.0
Coalgate	Yearlings	Drench	9	10	16.0	34.4
Coalgate	Yearlings	Drench	9	10	8.5	33.9
Coalgate	Yearlings	Drench	10	8	10.5	55.2
Lake Carl Blackwell	3 yr. Cows	Drench	50	50	4.8	9.9
Lake Carl Blackwell	5 yr. Cows	Drench	50	49	.8	3.9
Stillwater	Yearlings	Drench	24	20	1.9	4.3
Stillwater	Yearlings	Capsule	16	20	.6	4.3
Foraker	Mature Cows	Bolus	39	81	4.5	13.5
Foraker	Mature Cows	Bolus	104	23	1.8	6.8
Foraker	Heifers	Bolus	53	104	2.0	18.3
Foraker	Mature Cows	Capsules	43	81	2.5	13.5
Foraker	Heifers	Drench	39	39	1.2	12.8

Protein Supplements for Wintering Fall-Calving Cows.

A. B. NELSON, JAMES MILLER AND GEORGE WALLER

One of the main considerations in any cattle wintering program is the provision of adequate protein. The purchase of protein supplements represents a great portion of the cost of wintering cattle on native grass. Recently completed at this station was a test designed to study the relative value of supplements containing 20-, 30- and 40-percent protein when fed to heifer calves wintered on prairie hay or allowed to