Pour-on applications of

RUELENE

For Cattle Grub Control

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Successful feedlot applications of Ruelene for cattle grub control were made on steers and heifers of several breeds with short- to long-hair coats. Treatments were made, on arrival, in September and October at Imperial Valley feedlots, to animals brought in mostly from Arizona and Texas. Control was effective with Ruelene at 50 mg/kg applied by the pour-on method. No serious effects from using Ruelene on the cattle were observed, and the occasional instances of very temporary side-effects were not considered harmful.

THE IDEA of using the bloodstream to distribute a chemical throughout the body of an animal for controlling an insect pest originated in 1944 at the USDA laboratory, Orlando, Florida. In 1956 an organophosphate developed by the Dow Chemical Company showed promise for this purpose and for control of cattle grubs, *Hypoderma bovis* (L.) and *H. lineatum* (de Villers). Later studies with a series of related organophosphates led to the compound Ruelene (4-tert-butyl-2-chlorophenyl methyl methylphosphoramidate). The pour-on method of application for Ruelene, utilizing a small volume of concentrated aqueous emulsion put on the back of cattle with a dipper, was reported in 1960 from experiments conducted in South Dakota. Pour-on applications of Ruelene were first tested against cattle grubs in southern California in 1960.

The trials involved applications to steers and heifers of several breeds, including short- to long-hair coats. Most of the animals were brought to California from Arizona and Texas. Weights ranged from 350 to 500 lbs. The treatments for cattle grubs (*Hypoderma* spp.) were applied as the animals arrived at feedlots in Imperial and Riverside counties in September and October. The following January, counts of the number of grubs in the back were made by palpation.

Two formulations of Ruelene were used: an emulsifiable concentrate of 2 lb/gal (Dow No. M 1609) was used at one part mixed with two parts of water for pour-on applications; and a 25% wettable powder (Dow No. M 1560) was used in an aqueous spray mixture. Spraying was done with a rig that had a power-driven reciprocating piston pump and a mechanical agitator in the tank. The dosages of Ruelene used in the spray treatments included: (1) concentrations of 0.125, 0.25, 0.375, and 0.50% in the mixture; and (2) two and four quarts per animal, by volume.

Results of grub control for cattle treated with Ruelene pour-on at 50 milligrams per kilogram of body weight are listed in table 1. Trials 3 and 4 also included a treatment group for Ruelene pour-on used at 75 mg/kg body weight but this treatment did not give distinctly better control of cattle grubs than the 50 mg/kg dosage.

Data for the spray trials are shown in table 2. In trial 3, control comparable to that found with pour-on was obtained with the spray treatment of 0.50% concentration made with Ruelene 25% WP (wettable powder) applied at four quarts per animal with a spray pressure of 300 psi when this treatment was used on Hereford cattle. In contrast to the pour-on method, with averages of 0.1 grub per animal, the 0.50% spray applied with 350 psi was less effective in trial 1 on cattle with the short type hair coat with an indicated average of 0.5 grubs per animal. Control of grubs was also poorer with the lower concentrations of Ruelene in the spray and was directly associated with decreasing dosage. For a given concentration, control was poorer for the volume of two quarts than four quarts per animal. These results occurred with wettable powder in which the contact of Ruelene is likely not as good as would be obtained in spray mixtures prepared with an emulsifiable concentrate formulation.

Some of the experimental trials reported were conducted in the interior southeastern part of southern California near Blythe, El Centro and Indio. Daytime temperatures during September are commonly above 100°F, and relative humidities are low. The treatments were applied between daylight and mid-morning. During the various trials with Ruelene, very few symptoms of direct adverse effects or of side-effects (such as loss of appetite) appeared; those that occurred were temporary and were considered harmless to the cattle.

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TABLE 1. CATTLE GRUB CONTROL WITH RUELENE APPLIED BY POUR-ON, AT 50 mg/kg BODY WEIGHT, TO VARIOUS TYPES OF CATTLE

Trial	Group	Number head counted	Av. no. grubs/ head	Infested head %
1	Treated	23	0.0	0.0
	Check	24	5.5	62.0
2	Treated	29	0.07	6.9
	Check	53	9.88	84.9
3	Treated	20	0.10	10.0
	Check	20	13.60	100.0
4	Treated	9	0.10	12.0
	Check	10	7.20	60.0
5	Treated	1000	0.10	10.0
	Check	51	5.60	65.0

TABLE 2. TRIALS OF AQUEOUS SPRAY MADE WITH RUELENE 25% WP AND APPLIED WITH A POWER-DRIVEN SPRAYER OPERATED AT 350 OR 300 PSI FOR CATTLE GRUB CONTROL

Trial		Group	Concentration Ruelene %	Volume applied per head quarts	Number head counted	Av. no. grubs/ head	Infested head %
1	(Short	Treated	0.125	4	10	9.5	70
	hair	"	0.25	4	10	5.3	40
	coat)	"	0.25	2	10	13.2	60
		"	0.375	4	10	3.0	50
		"	0.50	4	10	0.5	40
		"	0.50	2	10	2.0	60
		Check	..	..	10	7.2	40
2	(Short	Treated	0.25	4	54	4.2	32
	hair	"	0.375	4	50	3.2	24
	coat)	Check	..	..	99	5.4	80
3	(Here-	Treated	0.50	4	328	0.1	6
	ford)	Check	..	..	29	22.7	100