

CIODRIN SPRAY AND DUST FORMULATIONS FOR HORN FLY, *HAEMATOBIA IRRITANS*, CONTROL ON BRAHMAN AND CROSSBRED CATTLE¹

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ABSTRACT

A study was conducted to determine the effectiveness of Ciodrin® (*alpha*-methylbenzyl 3-hydroxycrotonate dimethyl phosphate) when applied as a 0.5% spray or as a 3% dust in a self-applicating dust bag for control of horn flies, *Haematobia irritans* (Linnaeus), on Brahman and crossbred cattle at Belle Glade, Florida. The 3% Ciodrin dust reduced horn fly populations 49% on Brahman and 43% on crossbred steers. A weekly application of 0.5% Ciodrin spray reduced horn fly populations 86% on Brahman and 88% on crossbred steers. Untreated Brahman cattle averaged 78% fewer horn flies per steer than untreated crossbred cattle. Brahman cattle treated with a 3% Ciodrin dust bag had 80% fewer flies per steer than crossbred cattle on the same treatment. Brahman cattle had 75% fewer flies than crossbred cattle when both were treated with 0.5% Ciodrin spray. Brahman and crossbred cattle on the same treatment were confined to the same pasture during the study. All treatment and breed differences were significant at the 1% level.

The horn fly, *Haematobia irritans* (Linnaeus), is a major pest of cattle in the United States. Infestations of 4,000 flies per animal are common on cattle in Texas and occasionally as many as 10,000 flies have been observed on 1 animal (Bruce 1940). Damage to animals results from annoyance, blood loss, reduction in weight gain, reduction in milk production, severe skin irritation, and possible disease transmission. Hoffman et al. (1965) found that frequent mist spray applications of small amounts of Ciodrin® (*alpha*-methylbenzyl 3-hydroxycrotonate dimethyl phosphate) produced excellent horn fly control, and Cheng *et al.* (1965) found that 2% Ciodrin in both oil-based and water-based sprays produced excellent control of horn flies for at least 124 hr. Ciodrin was tested at the Everglades Experiment Station, Belle Glade, Florida to determine its effectiveness as a control of the horn fly when applied to cattle as a 0.5% spray or as a 3% dust in a self-applicating dust bag. Comparison of differences in horn fly populations between Brahman and crossbred cattle were studied.

MATERIALS AND METHODS

Ciodrin emulsifiable concentrate (1.1 lb/gal) and 3% Ciodrin Livestock Dusting Powder were supplied by Shell Chemical Company. Fifteen yearling Brahman steers and 15 yearling crossbred steers were used as test animals. The animals were divided into 3 experimental groups, a spray group, dust group, and an untreated control. Each group contained 5

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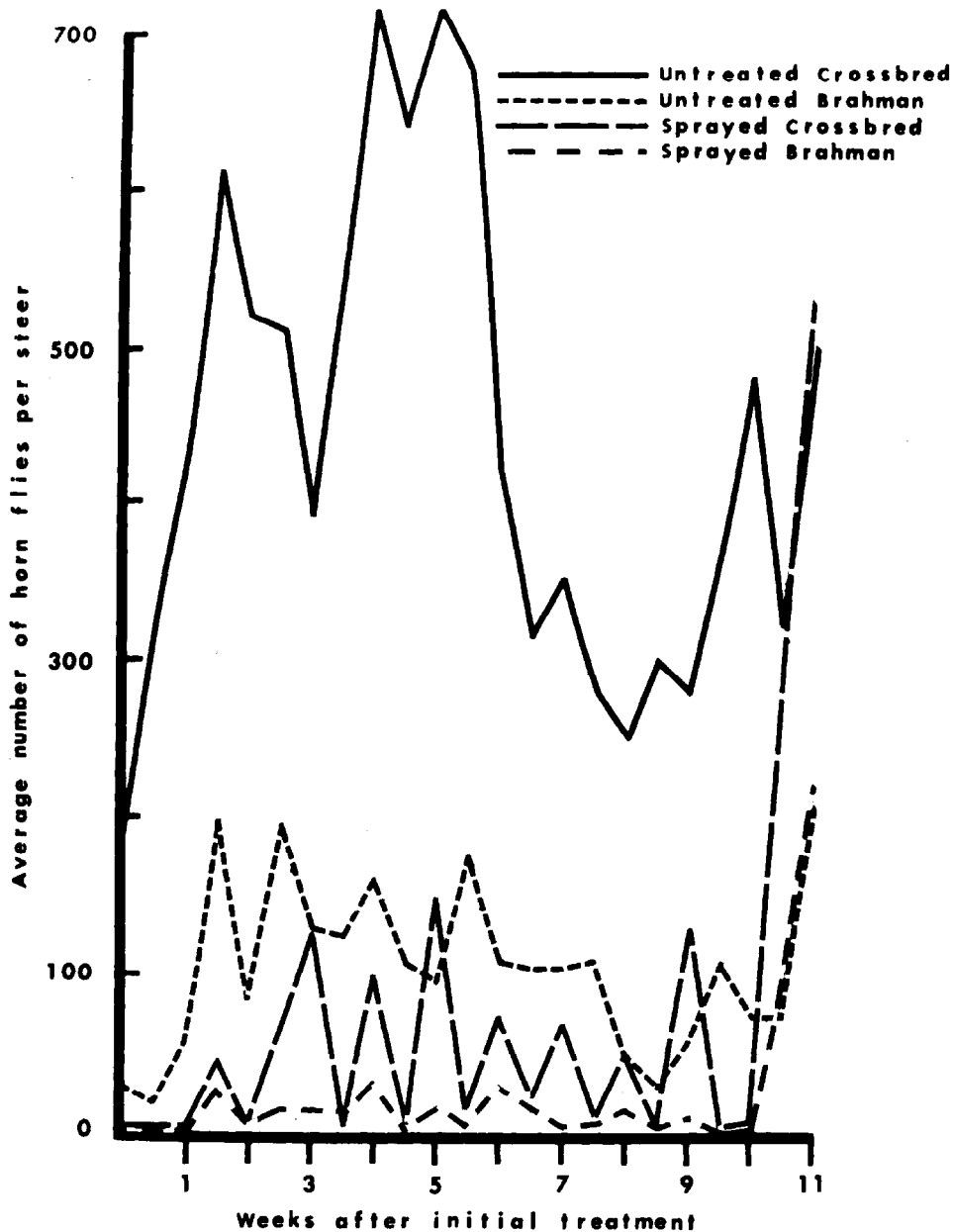


Fig. 1. Average number of horn flies per animal infesting untreated Brahman and crossbred steers compared to Brahman and crossbred steers treated with 0.5% Ciodrin spray.

Brahman and 5 crossbred steers. The spray group was treated weekly for 11 weeks with a 0.5% Ciodrin spray using a #0815 Tee Jet nozzle with an 86° spray angle. The spray steers received approximately 2 quarts of 0.5% Ciodrin per animal applied at a pressure of 200 psi. The dust group was treated by giving them access to 3% Ciodrin dust in a self-applicating dust bag. The bag was constructed of a double thickness of burlap. The interior was lined with plastic from the top to within 13 cm of the bottom. Shelter was not provided for the bag in order to test the effectiveness of

this plastic liner. Bag dimensions were 52 cm by 76 cm and it was suspended horizontally by ropes tied through 3 grommets. It was hung at a height of 1.2 m above the ground. The bag was placed near water and mineral sources which allowed free-choice use of the dust.

All horn fly counts were made 1 and 3 days after each weekly spray application. The number of flies on 1 side of the animal was counted and this number was doubled to give an estimated number of flies per animal. Counts were made between 9:00 and 10:00 AM.

RESULTS AND DISCUSSION

Horn fly estimates were evaluated with the use of analysis of variance and Duncan's multiple range test. There were significant (1% level) treatment and breed differences.

TREATMENT DIFFERENCES: Immediately after the first spray application, there was a reduction in horn flies (Fig. 1). Four weeks after the initial spraying the 5 untreated crossbred steers averaged 726 flies per steer. This was the highest horn fly population observed during the study. At the end of the first and second week, no flies were observed on the Brahman steers treated with 0.5% Ciodrin spray. The untreated crossbred steers had a significantly (1% level) higher population of horn flies than did the Brahman and crossbred steers in both insecticide-treated groups. Fig. 2 shows that the crossbred steers given access to a self-applicating dust bag had only a slightly lower horn fly population than the untreated crossbred cattle. The untreated Brahman cattle were significantly (1% level) lower in horn fly populations than the crossbred steers treated with 3% Ciodrin dust. When comparisons of horn fly populations were made between untreated and treated crossbred steers, the 3% dust reduced horn fly populations 43% and the 0.5% spray reduced fly populations 88%. Similarly, when comparisons were made between the untreated and treated Brahman cattle, the 3% Ciodrin dust reduced horn fly populations 49% while a 0.5% Ciodrin spray reduced populations 86%.

BREED DIFFERENCES: Untreated Brahman cattle averaged 78% fewer horn flies per steer than the untreated crossbred cattle. Brahman cattle that were treated with 3% Ciodrin dust had 80% fewer flies than did the crossbred cattle on the same treatment. Similarly, the Brahman cattle that were sprayed with 0.5% Ciodrin had 75% fewer horn flies than did the crossbred steers on the same treatment. In all cases where breed comparisons were made, the differences in horn fly populations were highly significant (1% level). The observed breed difference is probably a color preference of the horn fly for dark-colored cattle. Such a color preference has been observed by several authors. Bruce (1940) reported that horn flies tend to be more numerous on black and dark-colored cattle than on lighter-colored animals. In later studies, Hargett and Goulding (1962) showed that more horn flies congregated on dark than clear or white test surfaces. Franks et al. (1964) found that horn flies infested black heifers more than red heifers. Fewest flies were found on white animals. The Brahman cattle used for this study were white or gray while the crossbred cattle were either red or black. Because of the colors of the test steers, color preference may have contributed to the difference of horn fly populations between breeds.

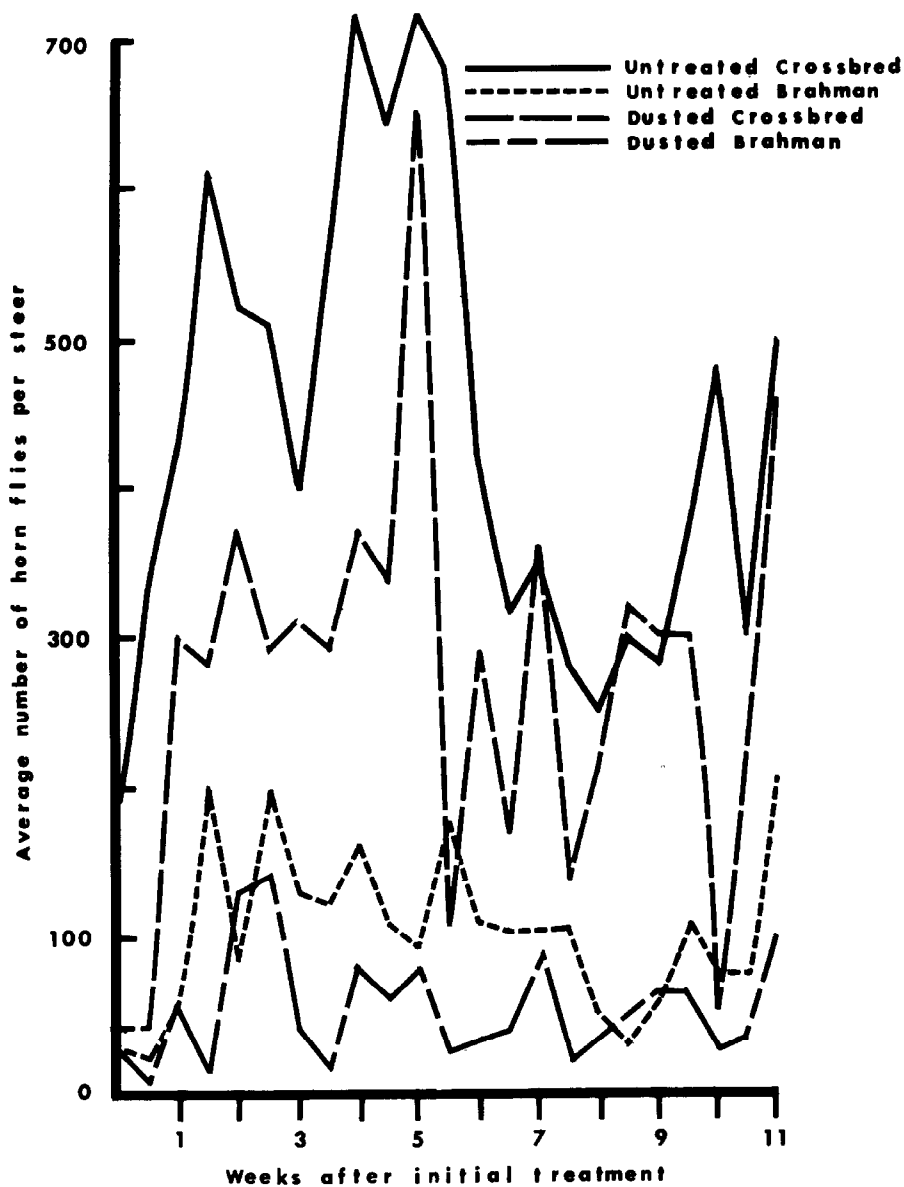


Fig. 2. Average number of horn flies per animal infesting untreated Brahman and crossbred steers compared to Brahman and crossbred steers treated with 3% Ciodrin dust.

For the entire study, the untreated crossbred steers averaged 450 flies per steer and the untreated Brahman steers averaged 100 flies per steer. The crossbred dust steers averaged 258 flies per steer and the Brahman dust steers averaged 51 flies per steer. The crossbred spray steers averaged 56 flies per steer and the Brahman spray steers averaged 14 flies per steer.

The self-applicating dust bag did not produce acceptable control for either Brahman or crossbred cattle. It was observed that the steers did

not use the dust bag effectively since only 6 lb of dust was used during the study. A 0.5% Ciodrin spray produced favorable control of horn flies for Brahman and crossbred cattle. Effectiveness of both treatments was hindered by the large amount of rainfall during the 11-week test period, which totaled 34 inches.

After the first application of 0.5% Ciodrin spray to yearling Brahman and crossbred steers, 1 of the Brahman steers displayed mild symptoms of organophosphate intoxication. These symptoms were observed approximately 30 min after the spray application and included mild muscle twitching and weakness manifested by staggering. Within 1 hr, all symptoms had disappeared. There were no other symptoms of organophosphate intoxication observed in this animal or any animal after subsequent treatments with 0.5% Ciodrin spray. Care should be exercised when Ciodrin insecticide is applied to Brahman cattle since they may be hypersensitive to organophosphates.

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