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Abstract

Dustacators (combination mineral feeders and livestock dusting devices) were used for four beef herds at Kansas State University in 1985. Loose mineral was supplied in all four Dustacator tubs, which were adjusted to low settings. Permethrin dust had no apparent effect on horn flies. Co-Ral® from two sources and Rabon® provided approximately 65% horn fly reduction during the 53-day test period. The 1986 experiment compared the effects of Dustacator mineral tub height adjustments and loose vs. block mineral. Co-Hal 1% dust from a single source was used in all treatments on two Simmental herds and two Polled Hereford herds. Excellent horn fly control was achieved and maintained except for a temporary increase in horn fly numbers in early September in all treatments. Face fly control was inadequate in all treatments in both years. Use of block mineral was related to reduced mineral consumption and self-application of more insecticide dust. High tub adjustment was related to greater mineral consumption but reduced self-application of insecticide. The degree of fly control was not correlated with amount of insecticide used either on a per-cow or per-herd basis. Simmentals consumed nearly twice as much mineral per head as Polled Herefords, but they used only 20% more insecticide. Including the cost of 1% Co- Ral dust and equipment costs amortized over 5 years, Dustacators provided acceptable horn fly control and some reduction of face fly numbers for $1.62 per cowlcalf pair, plus labor.

Keywords

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Horn Fly and Face Fly Control with the Dustacator® Combination Mineral Feeder and Livestock Dusting Device[1,2]

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Summary

Dustacators (combination mineral feeders and livestock dusting devices) were used for four beef herds at Kansas State University in 1985. Loose mineral was supplied in all four Dustacator tubs, which were adjusted to low settings. Permethrin dust had no apparent effect on horn flies. Co-Ral® from two sources and Rabon® provided approximately 65% horn fly reduction during the 53-day test period.

The 1986 experiment compared the effects of Dustacator mineral tub height adjustments and loose vs. block mineral. Co-Ral 1% dust from a single source was used in all treatments on two Simmental herds and two Polled Hereford herds. Excellent horn fly control was achieved and maintained except for a temporary increase in horn fly numbers in early September in all treatments. Face fly control was inadequate in all treatments in both years. Use of block mineral was related to reduced mineral consumption and self-application of more insecticide dust. High tub adjustment was related to greater mineral consumption but reduced self-application of insecticide. The degree of fly control was not correlated with amount of insecticide used either on a per-cow or per-herd basis. Simmentals consumed nearly twice as much mineral per head as Polled Herefords, but they used only 20% more insecticide.

Including the cost of 1% Co-Ral dust and equipment costs amortized over 5 years, Dustacators provided acceptable horn fly control and some reduction of face fly numbers for $1.62 per cow/calf pair, plus labor.

Introduction

The Dustacator Combination Mineral Feeder and Dusting Device has been in use since 1974 and has become popular among ranchers in several states. A Dustacator consists of a base, a vertical pedestal inserted upward through the center of a large rubber tub and metal tub support, and a cage to hold mineral blocks near the top of the pedestal. A circular dust bag skirts the circumference of the block cage, and the whole structure is topped with a galvanized metal rain cover. Dustacators thus force use of a self-dusting device without erecting fences around water sources or mineral stations. They are readily transportable between pastures or to different sites within a pasture and are sturdy but easily dismantled with simple tools.

[1]Appreciation is expressed to Fred Mann of Mann Enterprises, Inc., for supplying the Dustacators and insecticides used in this study.
[2]Appreciation is expressed to A.B. Broce, Dept. of Entomology, for help in the initial phase of this study.
[3]Extension Specialist, Livestock Entomology, Department of Entomology.

This study was begun in 1985 to compare the effectiveness of various insecticidal dusts used in Dustacators. In 1986, the study was modified to determine the effects, of variables made possible by the Dustacator design, i.e., the use of loose vs. block mineral and low vs. high tub adjustment. The two hypotheses tested were 1) cattle will get more dust on themselves, especially their faces, by accessing mineral blocks in the upper cage as compared to loose mineral in the tub and 2) when using loose mineral, the cattle receive more insecticide dust if the mineral tub is higher (closer to the dust bag).

Experimental Procedures

In 1985, a Dustacator was placed in each of four Kansas State University pastures having one corner in common. Each Dustacator was placed approximately one-half mile from this common corner and well away from water sources. There were between 30 and 35 cow/calf pairs and a bull in each pasture. A herd of 32 yearling heifers in a nearby pasture served as an untreated control herd.

Insecticides (Table 6.1.) were placed in the Dustacators on June 24, 1985. Loose mineral mix was placed in tubs at their lowest position. Fly numbers on cows were estimated at weekly intervals until August 16, when the study was terminated.

Table 6.1. Insecticide Dusts Used in Dustacators®, 1985.

Insecticide	Trade Name	Brand	Conc
permethrin	Permectrin	Anchor	0.25%
tetrachlorvinphos	Rabon	Co-op (Farmland)	3.0 %
coumaphos	Co-Ral	Kaw Valley, Inc.	1.0 %
coumaphos	Co-Ral	Dr. Scratch Products	1.0 %

In 1986, the same pastures and Dustacator locations were used. Table 6.2 provides a description of the test herds and the treatments imposed on them. Upward height adjustment of the tubs was limited by the need to provide space for cows' heads between the tub and the block cage above it.

The cattle were placed in their pastures on May 22, 1986. The Dustacators were set up the following day, and all were charged with Moorman's Co-Ral 1% Dust. No untreated herd was available to use in this trial, but horn fly counts on an untreated herd a few miles away provided an estimate of horn fly numbers in the vicinity during September.

Mineral was not placed in the Dustacators until May 30. The block mineral (SE pasture) was initially placed in the lower tub until cattle became accustomed to its location; on June 18, it was placed in the upper cage for the remainder of the season. Mineral and insecticide were weighed into the Dustacators and amounts remaining at the end of fly season were weighed and subtracted to obtain actual quantities used. Fly counts were made weekly, except when rainy weather prevented access to the cattle.

Results and Discussion

Horn flies, 1985. Horn fly numbers were lower at the study site than in most years, with a maximum of only 210 per side, in mid-August, on the untreated herd. Permectrin (0.25% permethrin) dust gave no control and was dropped from the trial after 37 days. Rabon (3% tetrachlorvinphos) dust and the two brands of Co-Ral (1% coumaphos) were equally effective, all providing about 65% reduction in horn fly numbers.

Face flies, 1985. Early in the season, it appeared that the Co-Ral formulations were providing better face fly control than either Permectrin or Rabon. However, when face flies became more abundant after mid-July, Co-Ral appeared to have little or no effect. Under our conditions, none of the insecticidal dusts provided adequate control of face flies. By August 9, up to 30 face flies were noted on some calves. Eye problems typical of pinkeye were becoming numerous. The test was terminated so that effective face fly control could be instituted.

Horn flies, 1986. Pretreatment horn fly counts on May 19 averaged 54 per cow side. On May 30, when mineral was placed in the Dustacators, there was a mean of 56 per cow side. Excellent horn fly control was achieved on all four herds within 2 weeks (treatment groups averaged 11 or less per side). Good control was maintained for 8 weeks. Horn fly numbers began increasing in mid-August and reached an experiment-wide average of 79 per cow side on September 4. Numbers declined to 33 per cow side on September 21, ranging from 28 to 41 among treatments. On September 28, there were 183 horn flies per side in the block-in-cage treatment, whereas numbers remained steady or declined in the other treatments (Figure 6.1).

No untreated cattle were monitored regularly, but on September 4 and 21, when horn fly numbers were relatively high on our test herds, there were about twice as many horn flies per animal on an untreated herd 8 miles away. From a number of years of observation in these same pastures and in others nearby, we believe that these treatments provided greater than 75% season-long reduction in horn fly numbers.

Face flies, 1986. The first face fly on cattle in this trial was observed on June 12. Numbers did not reach one per cow face until mid-July. The highest populations occurred from August 20 to September 4, after which they declined sharply. The herd with the block-in-cage treatment had six face flies per face on July 21 -- 4 weeks earlier than the next herd to reach that level of infestation. Several cases of pinkeye were treated in each pasture during early September.

Simmentals consumed more mineral than Polled Herefords. Cattle using the low Dustacator tub received more insecticide dust and better horn fly control than those using the high tub, even though they consumed less mineral. Less mineral was consumed from blocks than from the loose form, but cattle received more insecticide dust (Table 6.2).

The hypothesis that cattle receive more insecticide dust from a Dustacator when block mineral is used in the upper cage was supported by this limited test.

However, the same test failed to substantiate that this procedure results in better control of horn flies and face flies.

Overall, 146 adult cattle consumed 1,448 lbs of mineral (9.9 lbs per animal) during the grazing period. They also utilized 150 lbs of 1% coumaphos (Co-Ral) dust (1.03 lbs per animal). The insecticide cost 50.7 cents per lb, or 52.2 cents per cow. Amortizing the cost of the four Dustacators over a 5-year period, the equipment cost was about $160 for the 146 cattle, or $1.10 each. The total cost of acceptable horn fly control and some reduction of face fly numbers was $1.62 per cow, plus labor.

The Dustacator also has been tested by university entomologists in Virginia and Nebraska, using insecticidal dusts known to be effective against horn flies. In 1982, 1983, and 1984 horn fly control with Dustacators in Virginia varied from poor to excellent; face fly control ranged from very poor to good. In Nebraska, 1984, with 1% Co-Ral Dust and both loose mineral in the tub and salt blocks in the cage, control of both species was termed "excellent."

In 1987, two herds of cattle were observed in Jewell County, Kansas, under treatment with 1% Co-Ral in Dustacators. Horn fly control was excellent on a herd of 120 2-year-old Angus cows with calves. Face fly control was poor in both herds.

Table 6.2. Season-long Average Numbers of Horn Flies per Side, Face Flies per Face and Usage of Mineral and Insecticide Dust (1986)

	Pasture			
Item	NE	SE	NW	SW
Breed	P. Hereford	P. Hereford	Simmental	Simmental
No. of Cows & Yearlings	40	40	32	30
No. of Calves	27	23	18	18
Mineral form	loose	block	loose	loose
Min. placement	tub	top cage	tub	tub
Min. tub height	high	---	high	low
No. horn flies	25.60	29.18	24.63	19.81
No. face flies	1.33 $\pm$ 0.23	1.81 $\pm$ 0.22	0.67 $\pm$ 0.22	1.30 $\pm$ 0.21
Lbs. mineral/cow	8.64	5.82	16.80	11.05
Lbs. dust/cow	0.86	1.09	0.92	1.43

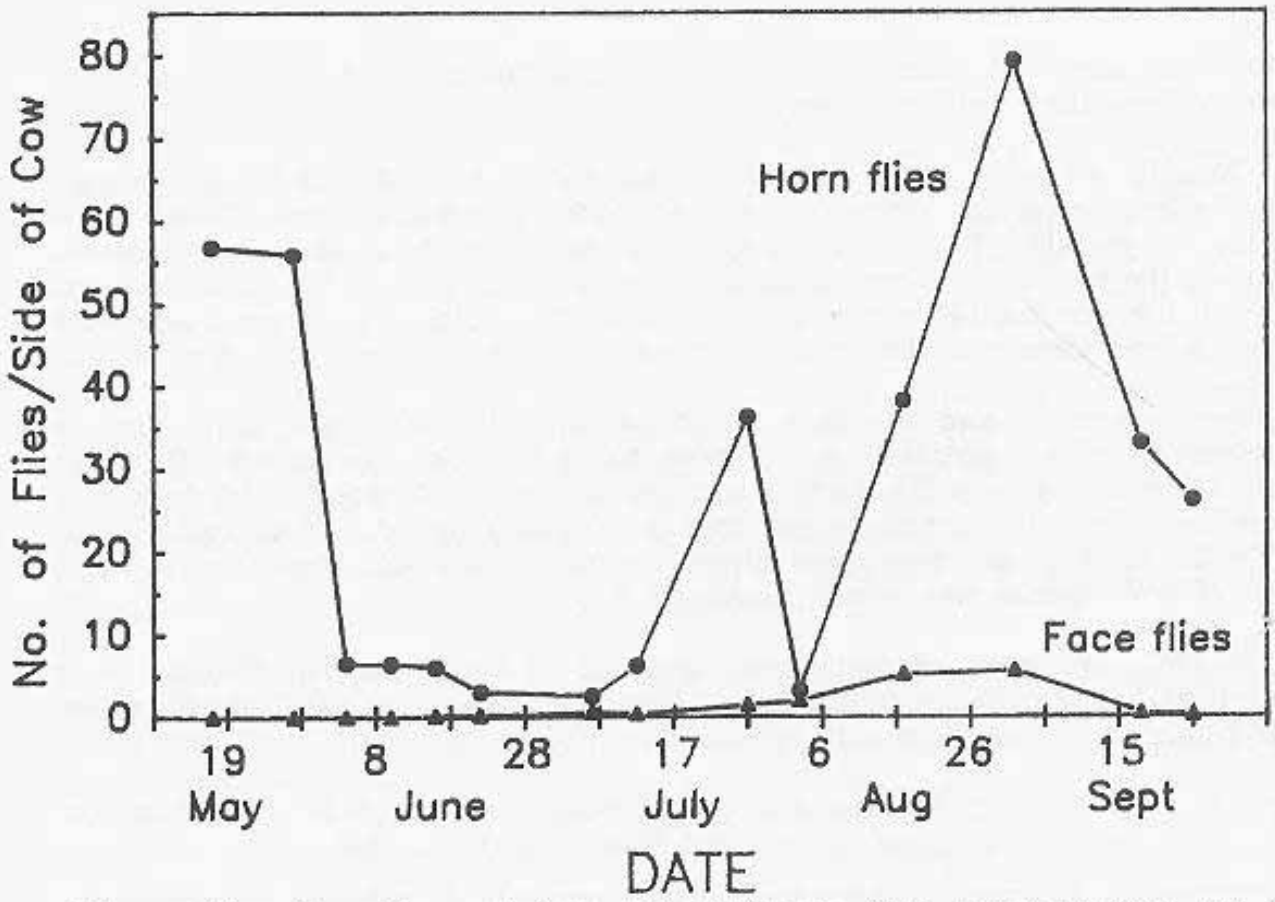
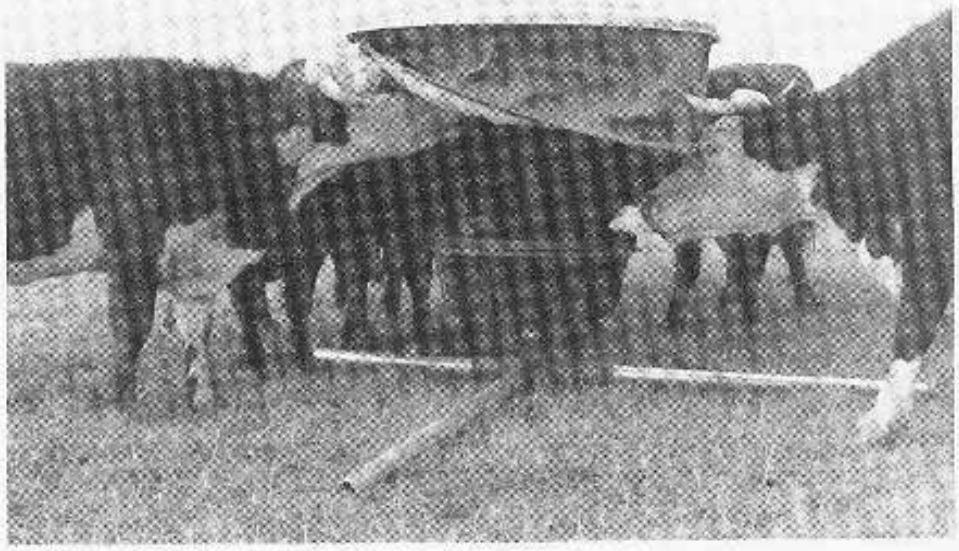


Figure 6.1. Horn Fly and Face Fly Incidence When Loose Mineral was Fed in Dusticators



As cattle consume mineral supplement from the feeder, insecticide from the dust bag is applied.