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**THE FLY BUSTER[®], A COMBINATION MINERAL FEEDER/SPRAY
DEVICE FOR THE CONTROL OF THE HORN FLY AND THE
FACE FLY ON PASTURED CATTLE**

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Summary

A combination mineral feeder/spray device was evaluated as a different approach for the suppression of horn and face flies under range conditions in east central South Dakota during the 1985 season. Ravap, Ectrin and Ciovap were applied at the rates of 1.25, .05 and 1.0%, respectively, to Black Angus cattle in three separate pastures with the spray device containing Morton's Farm and Ranch T-M salt containing iodine and other trace minerals. Cattle in a fourth pasture that were not treated were used as the control. A canister containing Freon 12 acts as a propellant to force the insecticide under pressure out of a nozzle that produces an aerosol spray over the cattle. A 3-way bulb valve linked to a face flap permits cattle to treat themselves when the animal pushes the flap inward. The entire device is on a swivel so that it turns easily and lessens the possibility of being damaged over time by a large herd of animals.

Ciovap provided excellent control for both face flies (94.9%) and horn flies (91.2%), while control was less effective with Ectrin (62.0% for the face fly and 75.01% for the horn fly). Face fly control was least effective with Ravap (42.5%), while horn fly reduction was 81.4%. Beef cattle in this experiment were observed to use the device routinely, but the effectiveness in fly control in the herd diminishes when the salt/mineral in the holding container has been depleted.

(Key Words: Horn Fly, Face Fly, Mineral Feeder/Spray Device, Control.)

Introduction

Prior to the late 1970's the most common tools available for horn fly, *Haematobia irritans*, control in the United States were sprays, backrubbers and dust bags. The backrubber was originally developed by experiment station entomologists in South Dakota (Rogoff, 1961) and Kessler and Berndt (1971) proved that dust bags would work equally well for horn fly control, but better results were obtained when cattle were conditioned to use the devices. In order to satisfactorily suppress horn fly populations, recent studies have shown that pastures need to be fenced so that animals are required to pass under the dust bag or backrubber enroute to water or to a salt nutritive source. Unfortunately, most producers in this state do not have their pastures arranged properly to provide good control with the use of these devices.

Ear tags containing synthetic pyrethroid insecticide have provided excellent control of the horn fly and have been of varying success in reducing face fly, *Musca autumnalis*, populations in South Dakota (Easton et al., 1985) for over

4 years. Numerous producers in the area of Martin, Todd County, South Dakota, however, claimed to have received poor horn fly control using Y-TEX Gard Star ear tags containing permethrin insecticides in late 1985. Furthermore, many producers in Bennett, Jackson, Stanley, Todd and Tripp Counties in western South Dakota have not purchased ear tags in 1986 due to their current lack of control. An alternate means for the control of these insects was therefore needed.

Experimental Procedure

The Fly-buster[®], a combination mineral and salt feeding spray device, was evaluated on three pastures in east central South Dakota in 1985 to determine its feasibility for use as an alternate management strategy for the control of these pests.

Each unit consists of a 12-gallon capacity liquid insecticide tank mounted on a tripod supporting base with a housing above the tank holding a container which provides 50 lb of feed or mineral salt to be ingested by an animal. A canister containing Freon 12 acts as a propellant to force the insecticide under pressure up to a 3-way bulb valve. The position of the valve is controlled by a mechanical linkage operated by a hinged face flap which an animal must move inward to access the salt or mineral supplement. In the resting position, the valve provides a liquid communication between a chamber and the pressurized liquid insecticide so that a quantity is pushed up into a small chamber and presses an air column. To consume the mineral supplement, an animal uses its head to push the face flap inward. A mechanical linkage moves the valve to a second position so that a chamber is in fluid connection with the spray nozzle and the quantity of liquid is propelled from the spray nozzle over the head and shoulders of the animal to be treated.

Three units were evaluated on three separate farms in east central South Dakota near Badger and DeSmet for the control of the horn fly and the face fly in 1985. Untreated cattle on a fourth farm constituted the check or control herd. Each unit was placed with a separate herd of approximately 100 head of Black Angus cows. When charged only with salt and mineral, the animals were soon observed using the apparatus. The first unit was charged with 1.0% Crotoxyphos/Dichlorvos (mix 1 gallon of Ciovap (10% + 2.5%) EC in 12 gallons of water), the second with .05% Fenvalerate (Ectrin) and a third charged with 1.25% Tetrachlorumphos/dichlorvos (Ravap) insecticide. All units were provided with Morton's Farm and Ranch T-M salt containing iodine and other trace minerals.

Results and Discussion

The best control was achieved using a 1% spray of Ciovap that provided 94.9 and 91.2% reduction, respectively, of face flies and horn flies (table 1). Ectrin provided 62.0 and 75.01% fly suppression, respectively. Ravap was the least effective material for face flies (42.5%), while horn fly reduction was better (81.4%).

Depending upon the size of a particular cattle herd, the costs over the long-term for the operation of the "Fly-buster" are generally more economical than the purchase of insecticide containing ear tags on an annual basis. When first introduced, ear tags retailed for approximately \$1 per tag, but in areas such as Mission, South Dakota, where tags containing pyrethroid materials were not working effectively in late 1985, they are currently retailing for only 75 to

85 cents each. A producer's cost could be estimated at \$120 annually for tags, assuming 120 head are involved, while estimates for the treatment of this number of cattle using the "Fly-buster" has been estimated at \$20 per month (period from June through September is generally involved in fly control, Smith, 1984). An initial investment of \$300 to \$400 is required to purchase the apparatus and an effort has to be made to replenish the salt or mineral supplement on a routine basis. Only the animals accessing the salt are treated rather than the entire herd simultaneously as would be the case with aerial or a ground spray operation.

The control of or the percent reduction of between 90 to 95% found to occur using Ciovap in the "Fly-buster" during 1985 is considered a better management practice than the 98 to 99% control received using the insecticidal ear tags containing a synthetic pyrethroid over the past several years.

Resistance is more likely to develop faster when 98% of the fly population is continually eliminated. With the use of ear tags containing pyrethroid, all flies that were susceptible to the insecticide were eliminated leaving only those that are resistant. When the resistance develops, the ear tags containing the pyrethroid are no longer of value.

On the other hand, a fly reduction of 80 to 90% does not completely eliminate the susceptible population and, when the insecticide pressure is not as great, resistance would not tend to develop as quickly. When populations of horn flies are reduced to 80 to 90%, the numbers of insects on the animal are also maintained below the economic threshold (estimate of 50 flies per side) and at this level the animal is not suffering economic loss (i.e., there is no reduction in the rate of gain).

Literature Cited

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TABLE 1. SUPPRESSION OF THE FACE FLY AND THE HORN FLY USING THE "FLY-BUSTER" IN THREE SEPARATE PASTURES^a IN EAST CENTRAL SOUTH DAKOTA DURING 1985

Date	Ravap (1.25%)		Ectrin (.05%)		Ciovap (1.00%)		Control	
	Face	Horn	Face	Horn	Face	Horn	Face	Horn
June 25	3.53 ^b	.86	.45	.46	.13	4.46	6.33	22.40
July 3	3.53	4.13	7.87	6.47	.73	2.53	16.87	39.33
July 17	10.93	12.26	11.73	10.93	.73	2.93	10.46	22.93
July 26	12.40	3.86	14.26	3.00	1.20	1.72	22.80	26.30
Aug 5	15.53	2.13	5.00	.40	1.80	1.26	25.40	20.06
Sept 27	0	0	.06	.93	0	.06	1.60	13.40
			% Control					
June 25	44.3	96.2	92.7	92.7	97.9	80.1		
July 3	79.1	89.5	83.3	83.5	95.7	93.5		
July 17	4.5	46.5	12.1	52.3	93.3	87.2		
July 26	45.6	85.3	37.4	88.6	94.7	93.4		
Aug 5	39.0	89.4	80.4	40.0	92.9	93.7		
Sept 27	0	0	96.2	93.0	0	99.5		
Avg mean	42.5	81.4	62.0	75.0	94.9	91.2		

^a Ravap and Ectrin were tested in two separate pastures belonging to Mr. W. Sorenson, 8 miles west of Badger. Ravap was tested in a pasture owned by Frank Virchow 6 miles southwest of DeSmet. The control herd was located 9 miles south of Brookings on Collins' farm.

^b Mean number of flies per 15 animals counted posttreatment.