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Emmett R. Easton  
*South Dakota State University*

Glen Bennett  
*South Dakota State University*

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EFFICACY OF TERMINATOR<sup>®</sup>, MAX-CON<sup>®</sup> AND Y-TEX EXPERIMENTAL IMPREGNATED  
EAR TAG (NC.602TC) FOR THE CONTROL OF RESISTANT POPULATIONS  
OF THE HORN FLY IN SOUTH DAKOTA DURING 1987

Emmett R. Easton<sup>1</sup> and Glen Bennett<sup>2</sup>

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Summary

Insecticide impregnated ear tags containing Diazinon or Dursban/cypermethrin combinations when applied at the rate of two tags per cow were more effective for the control of horn flies than tags that were applied at the rate of one per cow. With the Terminator<sup>®</sup> ear tag, the percentage control diminished after 8 to 10 weeks when one tag was present, but the percentage control remained constant over a period of 15 weeks with two tags per cow. With the Max-Con<sup>®</sup> tag control was less satisfactory after 6 weeks when only one tag per cow was applied, but good control was received after 15 weeks on animals where two tags per cow were used.

(Key Words: Diazinon, Chlorpyrifos, Cypermethrin, Insecticide Impregnated Ear Tags, Control, Horn Flies.)

Introduction

Horn flies are often controlled in range beef cattle operations in South Dakota through the use of dust bags, backrubbing devices, insecticide impregnated ear tags or with a combination mineral feeder/spray device called the "Fly-buster" which has recently been developed. Ranchers in western South Dakota seem to prefer the use of ear tags over other devices, however, since the employment of ear tags fits better with their management strategies that involve the rotation of herds among two or more pastures during the course of the summer season. A 50-fold level of resistance was discovered in horn fly populations west of the Missouri River in 1986 that had routinely been controlled for several years using synthetic pyrethroid impregnated insecticide ear tags containing fenvalerate or permethrin (Easton, 1986a,b). A need existed to examine ear tags containing alternate insecticides that could control these resistant flies. The Max-Con tag containing 5.0% chlorpyrifos and 7% cypermethrin with synergist provided excellent control of resistant horn flies under experimental conditions in western South Dakota in 1986. These results allowed the State Department of Agriculture to issue a special 24C state label so that the Max-Con tag could be sold by farm stores in South Dakota in 1987. The South Dakota pesticide impact assessment committee (SDPIAC) ruled, however, that only one tag per animal was sufficient to control the resistant flies. South Dakota was the only state in the nation to require that only one tag per cow be allowed to control horn flies. Other states approving the tag require a tagging rate of two per animal.

Research results from other states all indicated that two tags per cow will provide better control than one tag per cow. It was necessary to determine if there was essentially any difference in control with the use of one tag or two tags per head. The SDPIAC also recommended a special state 24C label for the Terminator ear tag even though this tag had not been tested previously in South Dakota.

Materials and Methods

Terminator<sup>3</sup> insecticide impregnated ear tags containing 20% Diazinon organophosphate insecticide were applied at the rate of two tags per head on a herd owned by Dave Larson near Flandreau, Moody County. Tags were also applied at the rate of one tag per animal to Black Baldy steers at the Range and Livestock Research Station in Jackson County and to a herd owned by Chandler Shippy near Colome, Tripp County. A control herd in which no treatments were applied was provided by Mr. Vint Williams in Jackson County.

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<sup>1</sup> Associate Professor of Entomology.

<sup>2</sup> Ag Research Technician, Range and Livestock Research Station, Philip, SD.

<sup>3</sup> Fermenta Animal Health, Kansas City, MO.

An experimental insecticide impregnated ear tag<sup>4</sup> was applied at the rate of two tags per head on cattle at the Range and Livestock Research Station. The Max-Con ear tag containing 5% chlorpyrifos, 7% cypermethrin synergized with 3.5% piperonyl butoxide<sup>2</sup> was applied at the rate of one tag per head and at the rate of two tags per head on separate herds owned by Mr. Vint Williams near Cottonwood, Jackson County.

Fly counts were carried out biweekly from May 28 through September 30 during morning hours in which horn flies were counted on the one side of 15 animals per herd including the control. The percentage control was calculated by subtracting the mean number of horn flies per count from the mean number of horn flies in the control herd and then dividing by the mean number of horn flies in the control herd times 100. Means and standard errors were computed for each sampling date.

### Results and Discussion

Terminator ear tags applied at the rate of one per animal provided an average mean percentage control of 84.5 and 82.7%, respectively (table 1), at the Colome and the Cottonwood sites while control was 10% higher (92.0%) where two tags were applied per head on the Flandreau herd.

Excellent control of horn flies was present with the experimental Y-Tex product at Cottonwood (93.0%, table 2). The Max-Con ear tags when applied at the rate of one per animal provided only 64.8% control (table 2) of resistant flies. However, the Max-Con ear tags applied at the recommended tagging rate of two per cow provided horn fly reduction of 88.8%. Two tags per cow should be used in the future which is consistent with research results obtained in other states as well as in South Dakota.

In general, the numbers of horn flies on pastured cattle east of the Missouri River have been lower in recent years than populations of flies on rangeland herds west of the river. This is reflected by the pretreatment fly count at Flandreau (table 1) in which only 51 flies were observed on May 15 as opposed to 250, 135 and 150 flies/side, respectively, in the Tripp and Jackson County animals. Control of flies in Flandreau using the rate of two tags/head may have been better if the population was lower at the outset and not resistant. However, the more effective control when using the two tags/cow rate in Jackson County supports a conclusion that 2 organophosphate containing tags will provide better control, particularly later in the season than if only 1 tag/animal is applied.

Horn fly populations in western South Dakota are assumed to be resistant to the synthetic pyrethroid insecticides fenvalerate or permethrin. Percentage control in these trials was lower than in former years when 90 to 100% control levels were reported (Kohler and Blome, 1982). Ear tags containing permethrin (Atroban, Gard-Star, Permethrin strips, ectiban tapes) or fenvalerate (Ectrin, Insecta-shield, Ear-tag plus) were not observed by the author on herds treated west of the Missouri River in South Dakota during the 1987 fly season. Ranchers in this area of the state should not use synthetic pyrethroid products in 1988 until there is evidence that the flies resistant to fenvalerate or permethrin are no longer present. Some producers east of the Missouri River in South Dakota were observed by the author tagging one-half of their herd with Terminator ear tags containing Diazinon and the other half of the herd with Atroban tags containing permethrin. Published data do not exist that would indicate that resistance can be prevented by mixing organophosphate containing tags with those containing synthetic pyrethroids. Resistant flies can still develop on cattle east of the Missouri River if they are treated with permethrin or fenvalerate pyrethroid insecticides. Producers who have not received good control with synthetic pyrethroid products in the past should use one of the newer products such as the Terminator or Max-Con tags so that resistant fly populations do not develop.

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<sup>4</sup>The Y-Tex Corporation, Cody, WY.

TABLE 1. EFFICACY OF TERMINATOR INSECTICIDE IMPREGNATED EAR TAGS CONTAINING 20% DIAZINON FOR THE CONTROL OF RESISTANT POPULATIONS OF HORN FLIES

Date	Week	Locality			
		Colome <sup>a</sup>	Cottonwood <sup>b</sup>	Flandreau <sup>c</sup>	Control Jackson
		Tripp County	Jackson County	Moody County	County
		$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	
May 15	Pretreatment	250 <sup>d</sup>	135	51	150
May 28	Posttreatment	8.7 $\pm$ 5.4	15.6 $\pm$ 7.3	19.4 $\pm$ 15.6	152.0
June 10	2	18.5 $\pm$ 14.1	23.6 $\pm$ 13.4	2.9 $\pm$ 3.9	91.6
June 24	4	12.3 $\pm$ 7.3	4.5 $\pm$ 2.5	1.7 $\pm$ 1.0	50.6
July 7	6	8.8 $\pm$ 2.4	8.0 $\pm$ 2.2	3.5 $\pm$ 2.0	58.3
July 21	8	11.7 $\pm$ 4.3	14.7 $\pm$ 5.2	8.8 $\pm$ 2.4	63.6
Aug. 6	10	14.5 $\pm$ 5.2	7.3 $\pm$ 2.6	10.9 $\pm$ 5.1	66.3
Aug. 18	12	13.8 $\pm$ 5.1	28.3 $\pm$ 12.6	4.7 $\pm$ 2.1	174.0
Sept. 8	15	19.1 $\pm$ 7.9	57.6 $\pm$ 35.0	15.0 $\pm$ 9.5	183.3
Sept. 23	17	55.7 $\pm$ 33.6	60.7 $\pm$ 21.1	22.3 $\pm$ 15.8	211.3
<u>Percent Control</u>					
May 28		94.2	90.4	87.9	
June 10		80.0	74.2	96.9	
June 24		75.8	91.1	97.9	
July 7		84.9	86.3	93.9	
July 21		81.6	76.9	86.5	
Aug. 6		78.1	88.9	83.5	
Aug. 18		92.0	83.7	97.7	
Sept. 8		89.5	70.4	91.8	
Sept. 23		73.6	71.3	89.4	
Avg mean		84.5	82.7	92.0	

<sup>a</sup> Herd owned by Chandlor Shippy.

<sup>b</sup> Range and Livestock Research Station.

<sup>c</sup> Herd owned by Dave Larson.

<sup>d</sup> Mean number of horn flies on 15 animals. Cow/calves at Colome and Black Baldy steers at Cottonwood were tagged at the rate of one tag per cow; the Flandreau herd was tagged with two tags per cow.

TABLE 2. COMPARISON OF Y-TEX EXPERIMENTAL INSECTICIDE IMPREGNATED EAR TAG NO. 602TC AND MAX-CON EAR TAGS CONTAINING 5.0% CHLORPYRIFOS AND 7.0% CYPERMETHRIN WITH SYNERGIST FOR THE CONTROL OF RESISTANT POPULATIONS OF HORN FLIES IN JACKSON COUNTY IN 1987

Date	Week	Y-TEX	Max-Con		Control <sup>b</sup>
		2 tags/cow <sup>a</sup>	1 tag/cow <sup>b</sup>	2 tags/cow <sup>b</sup>	
		$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	
May 15	Pretreatment	135 <sup>d</sup>	140	160	150
May 28	Posttreatment	10.9 $\pm$ 6.2	17.2 $\pm$ 9.8	18.0 $\pm$ 8.0	134.0
June 10	2	12.9 $\pm$ 7.3	19.2 $\pm$ 13.1	--	91.6
June 24	4	4.5 $\pm$ 2.0	34.0 $\pm$ 12.1	13.7 $\pm$ 7.3	140.6
July 7	6	5.0 $\pm$ 2.4	38.5 $\pm$ 9.0	--	58.3
July 21	8	1.6 $\pm$ 2.5	41.0 $\pm$ 11.4	10.0 $\pm$ 4.0	63.6
Aug. 6	10	5.1 $\pm$ 3.8	30.1 $\pm$ 10	--	66.3
Aug. 18	12	8.5 $\pm$ 1.5	37.0 $\pm$ 30	11.4	174.0
Sept. 8	15	12.0 $\pm$ 5.1	--	--	183.3
Sept. 23	17	19.1 $\pm$ 11.0	55.0 $\pm$ 29	22.6 $\pm$ 14.2	211.3
Avg mean		8.8	34.0	51.1	124.7
<u>Percent Control</u>					
May 28		91.9	87.2	86.6	
June 10		85.9	79.0	--	
June 24		96.8	75.8	90.3	
July 7		91.4	34.0	--	
July 21		97.4	35.5	84.3	
Aug. 6		92.3	54.6	--	
Aug. 18		95.1	78.7	93.4	
Sept. 8		93.4	--	--	
Sept. 23		91.0	74.0	89.3	
Avg mean		92.8	64.8	88.8	

<sup>a</sup> Range and Livestock Research Station, Philip.

<sup>b</sup> Herds owned by Vint Williams.

<sup>c</sup> Mean number of horn flies on 15 animals.

References

Easton, E. R. 1986a. The Fly-Buster, a combination mineral feeder/spray device for the control of the horn fly and the face fly on pastured cattle. S.D. Agr. Exp. Sta. Beef Report CATTLE 86-15:73.

Easton, E. R. 1986b. The status of horn fly resistance in South Dakota. S.D. Agr. Exp. Sta. Beef Report CATTLE 86-17:81.

Kohler, P. H. and L. Blome. 1982. Horn fly control on range beef cattle. S.D. Agr. Exp. Sta. Cow-Calf 82-8:62.