

1984

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### Recommended Citation

Simms, D.; Willman, T.; and Schalles, R. (1984) "Effect of insecticide impregnated ear tags on horn fly populations and suckling calf performance," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.2471>

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## Effect of insecticide impregnated ear tags on horn fly populations and suckling calf performance

### Abstract

Three trials were conducted to determine the effect of insecticide impregnated ear tags on horn fly counts and weight gain of suckling calves. In trials 1 and 2, cow calf pairs on two Kansas ranches were assigned to these treatments: 1) Control - no tag, 2) Cows Only - 1 tag per cow, 3) Calf Only - 1 tag per calf, and 4) Cow and Calf - 1 tag each. Each tag treatment was in a separate pasture. All insecticide tag treatments reduced ( $P < .05$ ) horn flies on cows and calves in July and August; however, by September the tags were only reducing ( $P < .05$ ) flies on cows. While the weight gain response to tags was variable, when trials were combined, all tag treatments increased ( $P < .05$ ) calf gains over controls. Using a single tag per cow was better ( $P < .05$ ) than a single tag per calf, while tagging both the cow and calf was no better than either single tag treatment. Average fly counts for each pasture were negatively correlated with calf weight gains indicating a strong relationship between fly populations and calf performance. In trial 3, apparent horn fly resistance to the insecticide in the tags resulted in terminating the trial mid-summer. Research in Kansas and other states indicates that horn fly resistance to pyrethroid insecticides is becoming a common problem which means that producers may need to revert to previously used methods of horn fly control.

### Keywords

Cattlemen's Day, 1984; Kansas Agricultural Experiment Station contribution; no. 84-300-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 448; Beef; Ear tags; Insecticide; Performance

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Effect of Insecticide Impregnated Ear Tags on  
Horn Fly Populations and Suckling Calf Performance<sup>1</sup>

**S**

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and Robert Schalles

**U**


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Summary

Three trials were conducted to determine the effect of insecticide impregnated ear tags on horn fly counts and weight gain of suckling calves. In trials 1 and 2, cow calf pairs on two Kansas ranches were assigned to these treatments: 1) Control - no tag, 2) Cows Only - 1 tag per cow, 3) Calf Only - 1 tag per calf, and 4) Cow and Calf - 1 tag each. Each tag treatment was in a separate pasture.

All insecticide tag treatments reduced ( $P < .05$ ) horn flies on cows and calves in July and August; however, by September the tags were only reducing ( $P < .05$ ) flies on cows. While the weight gain response to tags was variable, when trials were combined, all tag treatments increased ( $P < .05$ ) calf gains over controls. Using a single tag per cow was better ( $P < .05$ ) than a single tag per calf, while tagging both the cow and calf was no better than either single tag treatment. Average fly counts for each pasture were negatively correlated with calf weight gains indicating a strong relationship between fly populations and calf performance.

In trial 3, apparent horn fly resistance to the insecticide in the tags resulted in terminating the trial mid-summer. Research in Kansas and other states indicates that horn fly resistance to pyrethroid insecticides is becoming a common problem which means that producers may need to revert to previously used methods of horn fly control.

Introduction

Insecticide impregnated ear tags have been widely adopted in the beef cattle industry for horn fly control; however, many producers still question whether it is better to apply the tag to the cow, the calf, or to both. Furthermore, most ear tag research has measured the reduction in horn fly numbers without monitoring calf weight gain responses. Our trials were initiated to determine the effect of various insecticide tag treatments on horn fly numbers as well as pre-weaning daily gain in calves.

<sup>1</sup> Appreciation is expressed to Vernon Isaac, Edson; Gano Farms, Hill City and Bob Dickinson, Gorham for their cooperation in providing cattle and assisting with data collection, and to Diamond Shamrock Corporation, Cleveland, OH and

<sup>2</sup> Anchor Laboratories, St. Joseph, MO for providing ear tags for these trials.

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### Experimental Procedure

In trials 1 and 2, cow/calf pairs on two Kansas ranches were assigned randomly to the following treatments in separate pastures: 1) Control - no tag, 2) Cows Only - one tag per cow, 3) Calves only - one tag per calf, and 4) Cows and Calves - one tag each. Pastures were of similar type (upland, short grass) and stocked at a similar rate. Individual, non-shrunk calf weights were taken at the start of each trial (April 18 and May 2, 1983 for trials 1 and 2, respectively) and at weaning. Fenvalerate (Ectrin®) impregnated tags were used in trial 1 and permethrin (Permethrin Ear Tag®) impregnated tags were used in trial 2. Horn flies were counted monthly on 10 cows and 10 calves in each treatment, starting in July. Least Squares Means procedures were used to analyze the fly count and calf gain data, with adjustment for effect of calf sex on average daily gain.

In trial 3, cow/calf pairs were assigned randomly to either one fenvalerate (Ectrin®) impregnated tag per cow, or one permethrin (Permethrin Ear Tag®) tag per cow. The trial was initiated on May 21, 1983.

### Results and Discussion

Table 30.1 shows the average horn fly counts per month on both cows and calves in trials 1 and 2. All treatments gave almost total horn fly control on cows and calves in the middle of July; however, by the middle of August control had dropped to about 78% on both cows and calves in the single tag treatments. By mid-September, hornfly control dropped even further on all treatments, with the Cows Only tag treatment giving the best control (about 50%) of horn flies on the calves.

Applying a single tag to the cow gave slightly better horn fly control than placing the tag on the calf. Two tags per pair (Cow + Calf) gave only slightly better horn fly control than either single tag treatment. Based on these data, a single fly tag in either the cow or calf, or tagging both cow and calf, will give good fly control for most of the grazing season.

All tag treatments increased ( $P < .05$ ) average daily gain over control (Table 30.2). In addition, tagging cows only increased ( $P < .05$ ) calf gains 5.1% over simply tagging calves. Thus, even though cows are harder to tag, the extra calf gain may pay for the extra effort.

Trial 3, which was initially designed to compare 2 brands of tags, was dropped in mid-July since it appeared that neither tag was giving adequate fly control. Unfortunately, a control group wasn't included in this trial to serve as a baseline. However, research at the Ft. Hays Experiment Station located in the same area as this trial has indicated that horn flies have developed resistance to the pyrethroid insecticides. Confirmed cases of resistance to pyrethroid insecticides have been reported from several areas nation wide. If widespread horn fly insecticide resistance develops, much of the benefit shown in Trials 1 and 2 will be negated.

The data in Table 30.3 show a strong negative relationship between average fly counts and calf performance.

Table 30.1. Effect of Insecticide Impregnated Ear Tag Treatments on Monthly Horn Fly Populations - Average of Trials 1 and 2.

| Ear tag treatment | Least Squares Means, avg. no. horn flies |           |                  |           |                  |           |
|-------------------|--|-----------|------------------|-----------|------------------|-----------|
|                   | July                                     |           | August           |           | September        |           |
|                   | No.                                      | % control | No.              | % control | No.              | % control |
|                   | <u>Per Cow</u>                           |           |                  |           |                  |           |
| Control           | 147 <sup>a</sup>                         | —         | 422 <sup>a</sup> | —         | 489 <sup>a</sup> | —         |
| Cows Only         | 3 <sup>b</sup>                           | 98        | 44 <sup>b</sup>  | 90        | 210 <sup>b</sup> | 57        |
| Calves Only       | 12 <sup>b</sup>                          | 92        | 91 <sup>c</sup>  | 78        | 200 <sup>b</sup> | 59        |
| Cows + Calves     | 1 <sup>b</sup>                           | 99        | 2 <sup>b</sup>   | 100       | 236 <sup>b</sup> | 52        |
|                   | <u>Per Calf</u>                          |           |                  |           |                  |           |
| Control           | 25 <sup>a</sup>                          | —         | 98 <sup>a</sup>  | —         | 156 <sup>a</sup> | —         |
| Cows Only         | 0 <sup>b</sup>                           | 100       | 18 <sup>b</sup>  | 79        | 52 <sup>b</sup>  | 67        |
| Calves Only       | 2 <sup>b</sup>                           | 92        | 21 <sup>b</sup>  | 79        | 116 <sup>a</sup> | 26        |
| Cows + Calves     | 0 <sup>b</sup>                           | 100       | 0 <sup>b</sup>   | 100       | 147 <sup>a</sup> | 6         |

<sup>abc</sup> Values in the same column and data set with different superscripts differ significantly (P<.05).

Table 30.2. Effect of Horn Fly Control on Performance of Calves in Trials 1 and 2

| Ear tag treatment | No. pastures | No. calves | Least Squares Means |                            |
|-------------------|--------------|------------|---------------------|----------------------------|
|                   |              |            | Daily gain, lb      | % Improvement over control |
| Control-no tags   | 2            | 46         | 1.98 <sup>c</sup>   | —                          |
| Cows Only         | 3            | 72         | 2.17 <sup>a</sup>   | 9.6%                       |
| Calves Only       | 4            | 99         | 2.07 <sup>b</sup>   | 4.5%                       |
| Cows + Calves     | 2            | 44         | 2.12 <sup>ab</sup>  | 7.1%                       |

<sup>abc</sup> Values with different superscripts differ significantly (P<.05).

Table 30.3. Relationship Between Monthly Cow and Calf Horn Fly Counts and Calf Performance

| Month-Animal   | Simple Correlations Between Calf Average Daily Gain and Average Horn Fly Counts |
|----------------|---|
| July-Cow       | -.45  |
| July-Calf      | -.11  |
| August-Cow     | -.69*   |
| August-Calf    | -.72*   |
| September-Cow  | -.73*   |
| September-Calf | -.81  |

\*Values are statistically significant (P<.05).