EFFECTS OF APPLICATION DATE AND SELECTIVE TAGGING OF COWS AND CALVES WITH FENVALERATE EAR TAGS FOR THE CONTROL OF THE HORN FLY AND FACE FLY. 2

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Abstract: Tagging nursing calves with two fenvalerate ear tags per head at birth resulted in 100% seasonal horn fly, *Haematobia irritans* (Linnaeus), control on the calves and their dams. The average face fly, *Musca autumnalis* De Geer, reduction was greater on the calves than the dams (61% vs. 31%). Tagging of cows and calves with two fenvalerate tags per head in March, April and May resulted in 100% seasonal horn fly control. Face fly control was greatest the first few weeks after the appearance of the flies on the animals. Effective control was not achieved during the peak face fly population which occurred in late July.

Fenvalerate ear tags can be marked with some inks and can be used for short-term identification of the animals.

Key words: Ear tags, flies, cattle, fenvalerate.


With the advent of insecticide-impregnated ear tags for fly control on cattle there has been considerable interest in tagging cattle several weeks to months prior to the fly season. Producers prefer to tag calves when born or tag all nursing calves when they perform other operations such as vaccinations, worming, etc. When cattle are tagged as per label directions (two tags/head) season-long control of the horn fly, *Haematobia irritans* (Linnaeus), is achieved (Ahrens 1977, Ahrens and Cocke 1979, Knapp and Herald 1981). If tags are not removed or lost, complete horn fly control can be obtained for two seasons (Knapp 1982). Horn fly control also can be achieved by partial herd treatment with insecticide-impregnated tags (Sheppard 1980, Harvey and Brethour 1981, 1983).

Control of face flies, *Musca autumnalis* De Geer, however, is more difficult and early application or tagging only a portion of the herd may not be as effective against the face fly as the horn fly. While utilization of two tags per adult animal is usually recommended for face fly control, data suggest that best control is achieved when cows and calves are tagged with two tags per head (Knapp and Herald 1981). These workers tagged cows and calves in a herd with two fenvalerate tags/head and achieved an average of 90% face fly reduction for 21 wk. When only the cows were tagged with two per head, control was reduced to ca. 62% (Roberts and Kondralieff 1981, Herald and Knapp 1981). Greater face fly control is usually achieved the first 4 to 6 wk after tag application (Williams and Westby 1982).

1 DIPTERA: Muscidae.

2 The investigation reported in this paper (No. 83-7-39) is in connection with a project of the Kentucky Agricultural Experiment Station and is published with approval of the Director. Received for publication 28 March 1983; accepted 2 July 1983.
As a result of the short residual effectiveness of these tags against face flies, and because some cattle producers are using these tags as identification tags for nursing calves, tests were conducted to determine if tagging only the newborn calves would protect the entire herd from the face fly and the horn fly. Observations also were made to determine the reduction of these flies on cattle when cows and calves were tagged in late winter or early spring. Information on the use of insecticide-impregnated tags for identification purposes also was collected.

**MATERIALS AND METHODS**

**Test 1**

Each calf in an Angus herd of 50 cows was tagged at birth with two fenvalerate ear tags. Tagging of the calves began the last week of February and ended the last week of April. Each tag was marked with an identification number using either RITCHEY marking ink, or Y-TEX Corporation marking ink. Fly counts were made on 10 randomly selected cows and 10 calves between 11 a.m. and 2 p.m. each week. All flies on the face of each animal were counted as face flies. Horn fly counts were estimates of those found on one side of each animal inspected. Fly counts started on 21 May and continued bi-weekly through 28 September.

Another herd of 50 untreated cows and calves located one-half mile from the treated herd was used as a control.

**Test 2**

Both cows and calves in six mixed beef herds were tagged with two 8% fenvalerane ear tags/head. Each herd contained ca. 25 cows. Two herds were tagged 15 March, 15 April and 15 May 1982, respectively. One tag per animal was marked with an identification number using either an ALLFLEX marker or SUPER-MARK. Two nontreated mixed beef cow-calf herds of similar size were used for controls.

Face fly and horn fly counts were made as described in Test 1. Fly counts started the first week of May and continued bi-weekly through 9 September. All data from Test 2 were analyzed by use of the Duncan's new multiple range test.

**RESULTS**

**Test 1**

Tagging calves at birth (late February through late April) with two fenvalerate tags per head provided 100% horn fly control on cows and calves through 28 September (duration of test). Horn flies on control animals ranged from 65 to 325 per side and averaged 149 for the season. Face fly reduction on the untreated cows in the treated herd varied from 4 to 72% (the 4% was due to low number flies on control cattle due to cool weather) with a season average of 43.3% and reduction on tagged nursing calves ranged from 26 to 85% with a season average of 56.9% (Table 1). When both cows and calves were tagged, face fly reduction was greatest during the first 4 to 6 wk after the appearance of face flies (21 May).

Identification numbers made with the RITCHEY marker were more legible at the end of the season than were those made with the Y-TEX marker.

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3 Route 3, Box 58, Brighton, Co. 80601.
4 P.O. Box 1400, Cody, WY 82414
5 Delta Plastics Ltd., P.O. Box 940, Palmerston, North New Zealand
6 Fearing Mfg. Co., St. Paul, MN 55075
Table 1. Average number of face flies and percent reduction of these flies on cows when only nursing calves were tagged with 8% fenvalerate ear tags.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Weeks of treatment</th>
<th>Avg. for season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2*</td>
<td>4</td>
</tr>
<tr>
<td><strong>Tagged calves</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>face flies</td>
<td>2.4</td>
<td>0.5</td>
</tr>
<tr>
<td>% reduction</td>
<td>80</td>
<td>92</td>
</tr>
<tr>
<td><strong>Untagged dams</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>face flies</td>
<td>9.4</td>
<td>1.9</td>
</tr>
<tr>
<td>% reduction</td>
<td>5</td>
<td>43</td>
</tr>
<tr>
<td><strong>Untreated calves</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>face flies</td>
<td>11.8</td>
<td>6.4</td>
</tr>
<tr>
<td><strong>Untreated dams</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>face flies</td>
<td>9.9</td>
<td>3.3</td>
</tr>
</tbody>
</table>

* 21 May 1981.
† Flies inactive this week due to abnormally cool temperatures.
**Test 2**

Fenvalerate-impregnated ear tags provided complete horn fly control through 9 September (duration of test), regardless of treatment date. As in Test 1, face fly reduction was greatest the first few weeks after its appearance in the field (Fig. 1). During this test period, all treatments were significantly different ($P < .05$) from the untreated. There was no significant difference between the three treated groups through 15 July. On 29 July the May treatments had significantly less face flies per head than the March and April treatment but significantly more face flies per head from 12 August through the end of the test. The March and April treatments were not significantly different from each other throughout the test.

The number of face flies per head significantly increased ($P < 0.5$) each week on the untreated cattle, except for 12 August. No significant increase ($P < .05$) in face fly numbers were seen in the treated cattle until after 18 June.

Although all three treatment dates gave excellent face fly reduction through June, the May treatment was least effective during the last few weeks of the test. May treatment averaged 66.7% face fly reduction for the season as compared to 71.3% for the March treatment and 75.4% for the April treatment.

The ALLFLEX marker was superior to SUPER-MARK in legibility at the end of the season and was equal to RITCHEY marker in Test 1.

![Graph showing average number of face flies per head](image-url)

*Fig. 1. Average number of face flies on control cattle compared to cattle tagged in either March, April or May.*
DISCUSSION

Tagging nursing calves at birth or tagging all cattle in a herd 2-3 months prior to appearance of flies provided 100% control of horn flies in Kentucky but not of face flies. Face fly control appeared to be dependent upon the fly population and the release rate from the fenvalerate tag. The best face fly control was achieved early in the season when the fly numbers were at their lowest, and 5-7 wk after application of fenvalerate tags. According to J. A. Miller, USDA, Kerrville, TX, (personal communications), fenvalerate release rate declined from ca. 4 mg/d at 10 d to ca. 2 mg/d at 40 d. A comparison of our face fly efficacy data with the fenvalerate release rate cited above indicates that from 1.75 to 2 mg of fenvalerate must be released per day to obtain above 80% face fly reduction. This accounts for the good face fly reduction achieved 5-7 wk after tag application.

The correlation of the release rate of insecticide impregnated ear tags with face fly control allows one to “properly time” the tagging of cattle to achieve maximum control at the time of the peak face fly populations. Because this peak occurs from the middle of June through July in Kentucky and coincides with the greatest number of reported pinkeye cases in cattle (Thrift and Overfield 1974), the first week of June would be the optimum time to use insecticide-impregnated ear tags to obtain maximum protection against the face fly during its peak abundance. Later tagging, however, may not ensure better face fly control at the end of the season as indicated by the results of the May tagging date in this test. In this instance the early tagging may have suppressed the face fly density enough to prevent a large build up later in the season. This combined with higher temperatures and humidities later in the season may have caused the fenvalerate to release more rapidly, thus reducing its effectiveness against face flies later in the season.

No matter when the cattle were tagged in this test, season-long face fly control was not obtained, and the buildup of flies at the end of the season may increase the chance of the face fly becoming resistant to fenvalerate.

Marking the fenvalerate tags with inks will serve as a means of identifying cattle for the season. However the tag is usually lost after one season because they become brittle when the insecticide and plasticize are leached causing them to be easily broken at the shank.

REFERENCES CITED


