Fly Monitoring for Grazing Cattle 2014

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Cooperators:
• Dave and Meg Schmidt - Exira

Funding By:
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Web Link:

In a Nutshell

• Face and horn flies can damage livestock health and producer profits through the spread of disease and irritation to animals.

• Cooperators counted flies on their cattle to determine efficacy of control methods and to identify degrees of fly load that negatively impact cattle.

• Over time, reduction in fly load has been observed, seemingly due to selection of cattle and rotational grazing, along with some targeted fly control methods.

Key findings

• Environmental factors (windspeed, humidity, temperature, cloud cover) did not seem to correlate with fly load.

• Certain animals seem to be more prone to high fly loads; this may be due to color, genetics, or breed.

• Cattle behavior (bunching, kicking, stomping, tail flicking) was not strongly associated with fly load, although fly load was below accepted economic threshold levels in 2014.

Project Timeline:
May 2014 - October 2014

Background

Face flies (Musca autumnalis) and horn flies (Haematobia irritans) are two of the most economically-important fly species in beef cattle production. Controlling their populations is critical to animal health, productivity, and ultimately farm economics. Face flies do not bite, but irritate animals by feeding on facial secretions, which can transmit disease (Powell, 1995a). Horn flies, which localize to animals’ shoulders and sides, do bite, and in severe cases may cause anemia and reduce weight gain (Powell, 1995b). Presence of flies of either type causes cattle to bunch up and seek areas where there are fewer flies, reducing grazing time and thus further impacting gain. Chemical insecticides, whether as pour-ons or feed additives, reduce fly populations (Strong, 1993) but may also harm dung beetles and other beneficial insects (Brown et al., 1994). For the past two years, Practical Farmers members tested methods of counting fly loads on cattle, and identifying effective non-chemical means of reducing fly loads on grazing cattle. This trial extends that work, continuing to test different fly control methods, and to try and correlate behavior-based indicators of stress to fly loads.

Materials and Methods

Dave and Meg Schmidt rotationally graze about 40 cattle of mixed Angus descent. Cattle are moved to a new paddock twice daily, allowing rest periods of two months or more for some areas. Dave and Meg observed five cattle every two weeks throughout the summer (a sixth was culled after the second observation). Starting in late August, they set out a Fly Killer Kover™, a mineral feeder top soaked with a mixture of mineral oil and Ecto-Phyte™ (Agri-Dynamics). Other than that, no fly control treatments were used.

Fly load observations were conducted:
• At least every two weeks;
• One or two days before and after a new fly control method was imple-


- When animal stress or agitation was particularly evident.

The same cows or calves were observed throughout the trial. The number of face and horn flies on each animal (one side, for horn flies) were counted. Cooperators also noted environmental conditions (temperature, humidity, cloud cover, windspeed, precipitation) and cattle behavior (bunched up or spread out, heads up or down, kicking at bellies, tail-swishing, stomping, licking backs, etc). Any fly treatments in place were reported, as well as the dates they were implemented.

Results and Discussion

Face and horn fly counts for the cattle through the year are displayed in Figure 1. Following introduction of the Ecto-Phyte, horn fly counts were reduced but not face fly counts. Dave expected the opposite effect: “I would have expected the Ecto-Phyte to reduce face flies but not horn flies since it’s just a topical fly repellent.” Indeed, that had been observed in 2013. Dave also mentioned that because of wet weather and a faulty dispenser, it was hard to tell how effectively the Ecto-Phyte was applied to cattle in 2014.

The final two observation dates were marked by relatively high counts for both fly species. These two dates were also when the cows were in pastures they had previously grazed. Theoretically, because the life cycle of flies typically lasts between two and three weeks (Powell, 1995a; Powell, 1995b), keeping cattle out of a given pasture for at least that long should reduce fly load significantly, as flies hatching from manure pats would have died off without anything to feed on. This may not be the case, though: “Because parasite life cycles vary with temperature and moisture, they are not as predictable as your grazing cycles. It is just as likely that you will be moving stock back into the pasture at peak hatch as it is unlikely” (Gerrish, 2004). On the final date (Sept. 6), the cattle were also in a field near a neighboring cattle farm, so flies might have come from there as well.

The generally-accepted “economic threshold” level of face flies is 12 per cow, and the economic threshold of horn flies is 200 per cow (Powell, 1995a; Powell, 1995b). At fly loads above the economic threshold, the stress on the animals is enough that they will cease grazing and gain less weight due to irritation. In addition, the risk of cows getting fly-associated diseases (such as pinkeye) is greater. In 2014, there were no days when average horn fly counts were over the economic threshold, and only two days (Aug. 20 and Sept. 6) when face fly counts were above the threshold.

Dave and Meg checked cattle on each date in the morning (8-10am) and the average temperature throughout the year across each dates and at this time was around 69°F (range 60-73°F). Neither time nor temperature seemed to correlate with fly counts, nor did cloud cover.

The animals’ activity and location were recorded – whether they were bunched up or spread out, whether they were showing other signs of distress like tail swishing or licking. Cattle usually bunch up when flies are a nuisance and flick their tails, lick their bellies or sides, and stomp. Results from this year indicate no clear relationships between cattle bunching or behavior and fly counts (Table 1). However, Dave noted that the cattle would congregate in the mornings because they knew that was when they would be moved to a new pasture.

Dave and Meg watched the area for birds as well, and on several dates a large flock of swallows and cowbirds were present. While not seeming to correlate with high or low fly numbers on those days, the birds are known fly-eaters and as such are a welcome sight for cattle graziers.

Cow color was also noted as a variable, and red cattle had fewer flies compared to black cattle (Table 2). Face fly counts were greater for black cows at five out of seven observations, and horn fly counts were greater for black cows at six out of seven observations. This was also observed at six out of eight observations in 2013. Greater fly loads on dark compared to light-hided cattle was reported by Brown et al. (1994). There is also evidence that individual cattle may be more or less

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Average face and horn fly counts by cattle behavior</th>
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<tbody>
<tr>
<td></td>
<td>Face flies per cow</td>
</tr>
<tr>
<td>Spread</td>
<td>8</td>
</tr>
<tr>
<td>Loose bunch</td>
<td>11</td>
</tr>
<tr>
<td>Tight bunch</td>
<td>1</td>
</tr>
<tr>
<td>No tail flicking</td>
<td>8</td>
</tr>
<tr>
<td>Tail flicking</td>
<td>6</td>
</tr>
</tbody>
</table>
‘attractive’ to flies for genetic reasons (Brown, et al. 1992), so it may just be that by chance the less fly-prone animals are also red.

The Schmidts have been monitoring flies for three years now. Since they started in 2012, they have increased the frequency of pasture rotations (from 4+ days per paddock in 2012 down to a half day in 2014). This may help reduce fly load by distancing cattle from flies emerging from old manure piles (Powell, 1995a; Powell, 1995b), though as mentioned previously the fly life cycles are difficult to predict (Gerrish, 2004). Still, the overall fly loads on the Schmidts’ cattle have decreased:

- 2012 Avg.: 24 face flies, 125 horn flies, 0.74 pinkeye cases/AU
- 2013 Avg.: 13 face flies, 62 horn flies, 0.13 pinkeye cases/AU
- 2014 Avg.: 7 face flies, 49 horn flies, 0.15 pinkeye cases/AU

Dave and Meg, through their observations of the herd, have identified animals that seem to be more prone to pinkeye or otherwise perform less than they’d like. Most of these animals have been culled, which should improve the herd’s average resistance to pinkeye and sickness (Brown, et al. 1992). Interestingly, one cow family seems prone to pinkeye, but that particular cow’s fly counts were generally below the herd average on each observation day. Immune system strength is also important, not just “fly attractiveness.”

Conclusions and Next Steps

During the 2014 summer grazing season, Dave and Meg Schmidt observed lower face and horn fly counts compared to previous summers. Correlations were not observed between climate factors and fly loads on cattle, though for a second year they observed heavier fly loads on black compared to red cattle. Relationships could not be established between cattle behavior and fly load, which had been a goal of the project. But because of the lower fly counts in 2014, cows may not have been bothered enough to induce much stress behavior. The reduced fly load is likely due to a combination of weather factors and the Schmidts’ grazing management and selective culling.

Dave and Meg will continue to rotationally graze cattle and constantly strive to improve their pasture management. In time, they hope to improve the local ecosystem so that manure piles are broken down quickly by invertebrates, and pests like flies are consumed by a healthy bird population. Through selection and culling of their cattle, they hope to reduce disease incidence by maintaining a strong and healthy herd.

<table>
<thead>
<tr>
<th>Face flies</th>
<th>6-Jun</th>
<th>21-Jun</th>
<th>4-Jul</th>
<th>21-Jul</th>
<th>4-Aug</th>
<th>20-Aug</th>
<th>6-Sep</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red cows</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>14</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>Black cows</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>20</td>
<td>18</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Horn flies</th>
<th>6-Jun</th>
<th>21-Jun</th>
<th>4-Jul</th>
<th>21-Jul</th>
<th>4-Aug</th>
<th>20-Aug</th>
<th>6-Sep</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red cows</td>
<td>37</td>
<td>38</td>
<td>17</td>
<td>20</td>
<td>23</td>
<td>53</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Black cows</td>
<td>83</td>
<td>70</td>
<td>37</td>
<td>19</td>
<td>37</td>
<td>133</td>
<td>58</td>
<td>62</td>
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Table 2

Face flies congregate around the eyes and nose, feeding on secretions

References


PFI Cooperators’ Program

PFI’s Cooperators’ Program gives farmers practical answers to questions they have about on-farm challenges through research, record-keeping, and demonstration projects. The Cooperators’ Program began in 1987 with farmers looking to save money through more judicious use of inputs. If you are interested in conducting an on-farm trial contact Stefan Gailans @ 515-232-5661 or stefan@practicalfarmers.org.