

## 7. Flies on pastured cattle

### 7.1 Manipulation of fly-load on heifers

The purpose of the field trials was to evaluate the efficacy of potential fly-repellants and attractants released from a tube dispenser attached to the cattle. The following fly species *Hydrotaea irritans*, *Haematobia irritans*, *Haematobosca stimulans*, *Musca autumnalis* and *Haematopota pluvialis* were recorded when present on the heifers. In the following a summary of the results obtained with *Ha. irritans* is presented.

Six different chemicals were delivered by IACR-Rothamsted, ready for use and applied to sponges in sachets. To slow down evaporation, the sachets were kept in the freezer when not in use. To protect the sachet and to protect the animals from the chemical, the sachet was placed in a dispenser, which was fixed to a leather belt. When a test was conducted, the belt was fixed around the chest of the heifer right behind the front legs. The dispenser was made of stainless steel and aluminium.

For the testing of one semiochemical, one herd was used. The heifers used were selected in a herd of approximately 40 heads, based on the heifers' ability to attract flies. Two small herds (7 heads each) were then gathered in such a way that both fly-attractive and fly-repellent heifers were used. Based on the fly-count data from day 0, the cattle were ranked with respect to fly-load.

On day one the dispensers on the two least fly-attractive cattle were loaded with a sachet containing the chemical. The flies on each heifer were identified and counted 6 times during the day. On day two the dispenser on the two most fly-attractive heifers was loaded with a sachet containing the same chemical. During the day, flies were counted as on day 1. As we had two herds at our disposal we could run two tests at the same time, using different chemicals.

With two of the chemicals there seemed to be some repellence towards the flies. When the least fly-attractive heifers were treated, they seemed to lose even the few flies they had had before the treatment. When the most fly-attractive heifers were treated the number of flies went down, and the number of flies on the least fly-attractive heifers went up. The same applied when three sachets were used per heifer, although it was even less clear as with the tests with only one sachet. With caution, based on these

data, it can be argued that these two chemicals used on the most fly-attractive heifers in the herd redistributed the flies, so that the differences in fly-load between the different heifers were reduced. A more detailed study of the data will be needed to confirm this.

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## 7.2 Microbial control of flies on pastured cattle

The aim of this project is to gain information of entomopathogenic fungi as potential candidates for microbial control of horn flies (*Haematobia irritans*), face flies (*Musca autumnalis*), and other fly species on pastured cattle. This includes a survey of naturally occurring fungal pathogens in these fly populations. In the time period from July to September live flies were collected every 14 days from six locations with pastured cattle. After 7 days of incubation in cardboard cages supplied with bovine blood, water and dried milk powder, dead flies were examined for signs of fungal infection.

The hyphomycetes *Beauveria bassiana* and *Verticillium lecanii* were isolated from a few flies from each location. These fungi did not appear to be a major mortality factor for adult flies, however. Similarly, no flies were infected by fungi from *Entomophthorales*. This is surprising, because there appears to be several good opportunities for disease transmission from other flies that are frequently infected by fungi from the '*E. muscae*' complex: in five locations houseflies (*Musca domestica*) in nearby stables were infected by the fungus. Horn flies can frequently be seen entering the stables with the cattle, and although they leave again quickly, there is a possibility of inoculum transfer during their stay there. Also infected houseflies were collected from hedgerows and from heifers pastured near a dung hill. In one location, different flies including sweat flies were observed resting on thistles with vast numbers of fungus-infected flies, but none of the horn flies and sweat flies collected from this location died from *E. muscae*. On a few occasions biting flies and face flies infected with *E. schizophorae* (4-6 nuclei) or *E. muscae* (15-23 nuclei) were found in additional surveys. This emphasizes that despite the negative results from the main survey, these flies can be infected with '*E. muscae*' in the field. The survey is to be continued in 1998.

Preliminary infection experiments with adult horn flies and face flies showed that both species are readily infected by fungi such as *Beauveria bassiana*, *Paecilomyces fumosoroseus* and others.