Report: Comparison of blowfly traps for the control of fly strike.

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Background

Blowfly strike continues to be a major problem for sheep welfare. Current control involves the use of dip, pour-on or spray-on insecticides, but fly trapping may help reduce strike incidence. Flies are also a problem with cattle and traps might help reduce the numbers of flies on cattle.

Objective.

1. To compare the efficacy of three types of trap (Agrilure, Redtop and Rescue) for catching blowflies.
2. To determine the numbers and species of flies caught by two American traps claimed to catch biting flies.

Materials and methods.

Blowfly traps

Three commercially available fly traps were placed out at each of three farm sites in South West England. Traps were placed out on the 6th of July 2008 at sites 1 and 2 and the 20th July 2008 at site 3. The three traps, all purchased in the UK, were the Rescue Disposable fly Trap (Sterling Rescue USA), the Redtop Trap (Miller Methods, Johannesburg, RSA,) and the Agrilure Trap (Agrimin Ltd, Brigg, UK).

Site 1 was located approximately 13.5 km south of Bristol at 100-170 m above sea level. It was an area of permanent pasture divided into a number of fields, measuring between 21.1 ha to 40.5 ha. The site was grazed by a flock of approximately 250 ewes and 300 lambs. Site 2 consisted of an area of permanent grassland pasture located on an organic beef/sheep farm located approximately 5 km south west of Bristol, and grazed by approximately 130 South Devon beef cattle and 60 mixed-breed sheep, over an area of 85

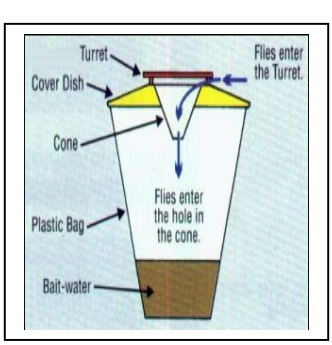
hectares. Site 3 was in Devon - approximately 12 km south west of Exeter, and has two flocks totalling approximately 500 sheep and lambs.

The traps were attached to 15 cm diameter wooden posts placed at approximately 1.5 m above the ground to avoid interference from sheep. At each site, the three traps were placed about 1 m in from the edge of a single field, approximately equidistant from each other and a minimum of 200 m apart. Traps were inspected twice weekly at 3 to 4 day intervals. When the flocks of sheep were moved between pastures, the traps were moved into the new fields shortly afterwards.

The Agrilure trap is composed of a white corrugated-plastic cube (30 x 30 x 30 cm), with entry slits in each side. It was baited with freeze-dried liver, as supplied by the manufacturers, to which water was added when the trap was first placed out. The liver was not replaced during the trial but the water was topped-up as required. The Agrilure trap contains four vertical black sticky strips, to which flies adhere when they enter and alight in the trap. These strips were removed and replaced with fresh strips at each inspection. In the laboratory all green-coloured Diptera were removed.

The Rescue Disposable fly trap is composed of a plastic bag, clear over its upper half and obscured by printing below. The bag contains a commercial powdered bait, to which water is added when it is to be used. Flies are attracted by the bait, enter through a yellow one-way cap and fall into the watery bait, where they die. At each inspection the top of the bag was cut open and the watery-bait was washed through a sieve. All Diptera were picked out and placed into sample pots. The entire trap was then replaced at each inspection with fresh water added to the bait.

The Redtop trap also consists of a completely clear polythene bag with a proprietary powdered bait. Flies are attracted to the odour enter through a hole at the top, covered by a red-coloured cap. A mesh cone beneath the opening ensures that flies cannot escape once they have entered. Flies then fall into the watery-bait and die. However, for this trap the manufacturers instructions state that the bait requires a period of 3 or 4 days after



water is added for it to become attractive. For this trap therefore, water was added to batches of powdered bait in the laboratory, 3 or 4 days prior to each inspection. At each inspection, the old watery bait was removed and sieved, all Diptera were picked out and deposited into sample pots. Fresh, aged bait was then added to the trap.

At each inspection, the traps were rotated one position around each field, so that by the end of the trial each trap had been in each position an equal number of times. This procedure was adopted to remove any systematic positional bias in trap catch.

In the laboratory, *L. sericata* and other *Lucilia* species were identified, sexed and counted under a binocular microscope. Trapping continued for twelve weeks at sites 1 and 2 and ten weeks at site 3.

Results

With all *Lucilia* species pooled, there was a highly significant difference between the number of females caught per day by the three trap types ($F = 5.32$, $P < 0.01$, Fig 1). There was no significant effect of farm ($F=1.53$, $P =0.22$) and no significant interaction between farm and trap type. A Tukey multiple range test showed that the Agrilure trap caught significantly more female *Lucilia* than either the Rescue or Red Top trap, while the latter were not significantly different from each other in catch.

With *L. sericata* alone, there was no significant difference, between the number of females caught per day by the three trap types ($F=1.2$, $P = 0.3$, Fig. 2). There was no significant effect of farm and no interaction between farm and trap type. However, catches of *L. sericata* were very low and the variance correspondingly high.

Consideration of the rate of catch of female *L. sericata*, by comparison of the cumulative numbers caught over time, shows that the Agrilure trap failed to begin catching until about day 30 after initial deployment (Fig. 3). It subsequently caught *L. sericata* at a faster rate than the other two traps. In contrast the Rescue and Rep Top traps caught flies quickly after deployment.

Conclusion

It was notable from examination of the cumulative rate of *L. sericata* catch, that the Agrilure trap was very slow to start catching *L. sericata* and it seems likely that the freeze-dried liver bait used for the Agrilure trap required a period of about 30 days to become fully rehydrated and decompose to the degree required to attract and catch *L.*

sericata. Obviously the bait requires modification so that it performs fully very shortly after placing in the field. It is then possible that it might outperform the other two traps, particularly the Red Top trap in terms of the rate of *L. sericata* capture
In order to be able count the blow flies caught the liquid based traps had to be emptied regularly. Whether leaving the traps un-emptied for as long as possible would improve the efficacy of the RedTop and Rescue traps is not known. In practice they would only need to be emptied when full and the time this would take is not known. It will depend on the time of year, the weather and the numbers of other species of flies caught. This is important because the ultimate decision on which trap to use depends on a cost benefit analysis. The costs as purchased were: Agrilure £17, Red Top £10, Rescue £4.80. Agrilure would require replacement sticky strips although there may be enough for one year in the kit, Rescue is throw away but RedTop comes with replacement bags (cost £5 each).

Where next?

Two further trials are required. 1) A sheep farm trial involving 10 farms where Agrilure traps are put out at the beginning of the blowfly season and emptied as necessary. This will determine whether blow fly strike can be prevented or significantly reduced by trapping. 2) A smaller trial of 2 farms using all three types of traps where the frequency of emptying or changing traps can be determined so that the most cost effective trap can be chosen.

Figure 1. The mean (±95% confidence intervals) number of all *Lucilia* females caught per day by three different trap types at three farms in South West England between July and September 2008. Trap 1: Agrilure; Trap 2: Rescue; Trap: Red Top.

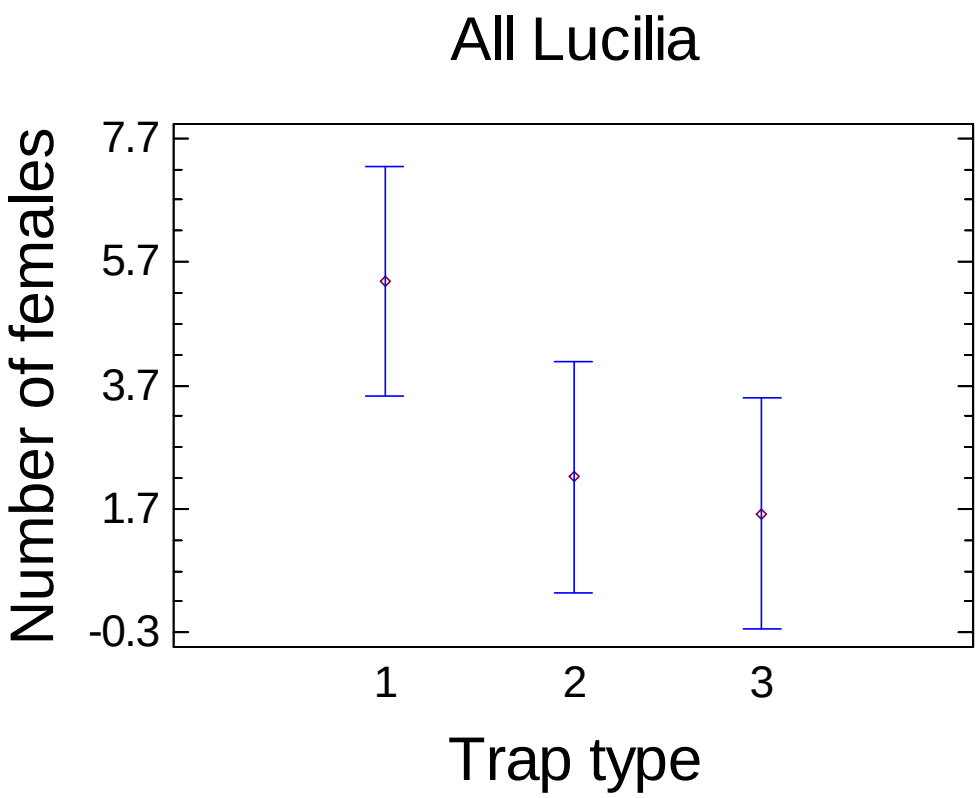


Figure 2. The mean (±95% confidence intervals) number of *Lucilia sericata* females caught per day by three different trap types at three farms in South West England between July and September 2008. Trap 1: Agrilure; Trap 2: Rescue; Trap: Red Top.

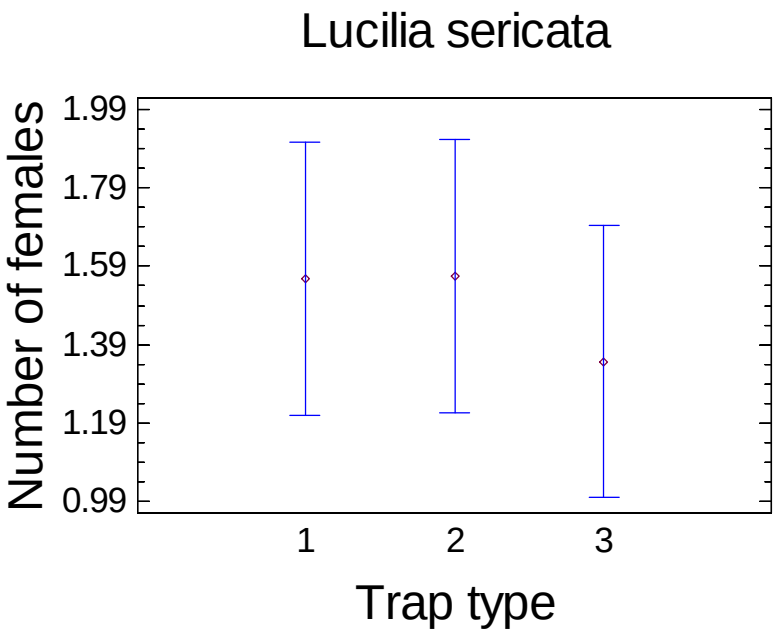
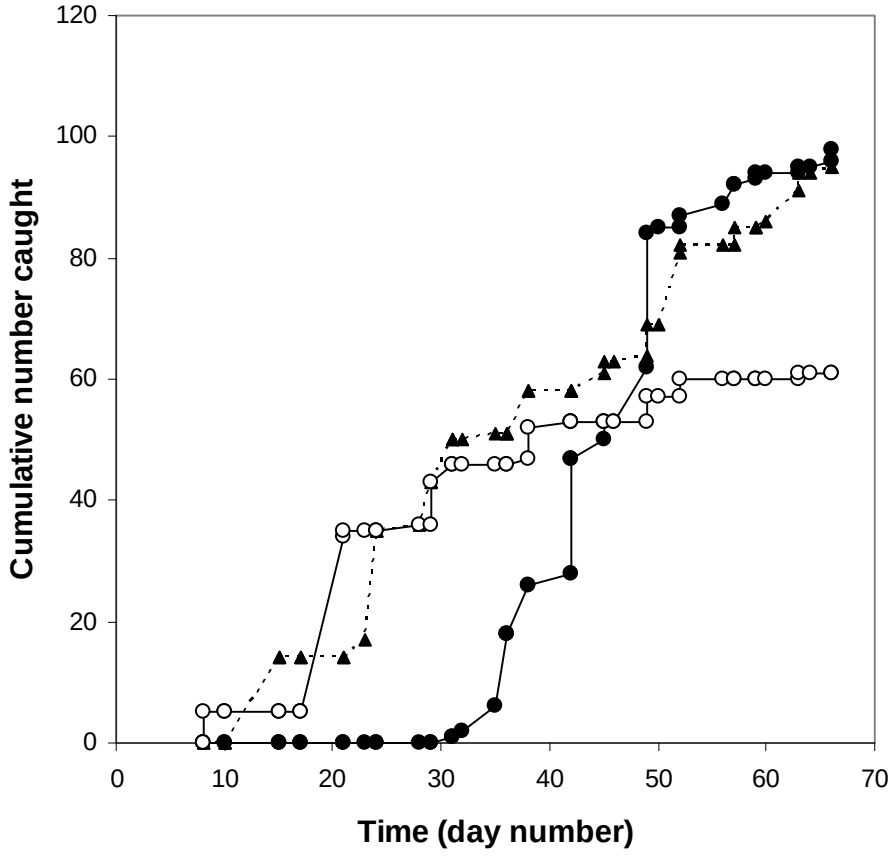


Figure 3. The cumulative number of *Lucilia sericata* females caught per day by three different trap types at three farms in South West England between July and September 2008. Trap 1 (Agrilure) solid circles; Trap 2 (Rescue): solid triangles; Trap 3(Red Top): open circles.



Comparison of traps for the capture of biting flies

Introduction

Biting flies can be a nuisance, transmit disease and flies are a problem on dairy cattle. Their control with chemicals poses both the problem of residues on cattle and the development of resistance that has occurred widely in the Americas with horn fly.

Objective

The objective was to compare two American biting fly traps, the Epps biting fly trap and the Horse Pal trap.

Methods and materials

The two types of traps were placed out at each of two farm sites in South West England. Traps were placed out on the 6th of July 2008 at sites 1 and 2. The two traps were the Epps Biting Fly Trap™ (Horse Line Products Inc., Henderson, USA) and the Horse PalR (Newman Enterprises, Omro, USA). Site 1 was located approximately 13.5 km south of Bristol at 100-170 m above sea level. It was an area of permanent pasture grazed by a herd of approximately 200 dairy cattle. Site 2 consisted of an area of permanent grassland pasture located on an organic beef/sheep farm located approximately 5 km north west of Bristol, and grazed by approximately 130 South Devon beef cattle and 60 mixed-breed sheep.

Horsepal Biting Fly Trap

This trap is essentially a modified version of the well established “Manitoba” fly trap and consists of a black plastic ball, approximately 75 cm in diameter, suspended beneath a metal-framed cloth collar, leading to a netting mesh funnel with a clear-plastic collecting bottle at its apex. An internal metal mesh funnel prevents insects flying back out of the collecting bottle. The plastic ball is suspended by wire from the centre of the

trap and movement of the ball is designed to attract flies, which fly into the funnel and up into the plastic collecting bottle top.

Epps Biting Fly Trap

This trap consists of two large black metal trays (approximately 33 x 105 cm), stacked one above the other. The traps are filled with water to which detergent has been added to break the surface tension. Above each water-filled tray, clear polythene deflectors are used to create slopes designed to channel flies into the water, where they drown. Either side and above each of the water-filled trays are large black sheeting wings. The black sheeting of this trap attracts the flies, which then drop down onto the transparent plastic deflectors and from there into the water-filled trays.

The traps were inspected twice weekly, flies were collected from the Horsepal trap into a polythene bag, returned to the laboratory and, where necessary freeze killed prior to identification. Flies from the Epps trap were removed from the water using a net, returned to the laboratory and dried overnight prior to identification. All *S. calcitrans* were identified to species, *Tabanus*, and *Haematopota* were identified to genus only. Non-biting insects caught were counted in a general "other" category.

Results

The Epps Biting Fly Trap caught a significantly higher number of *Stomoxys calcitrans* than the Horsepal Trap ($F_{1,66} = 17.13$, $P < 0.001$, Fig. 1) at both farm sites. There was no significant difference in the number of *Tabanus* ($F_{1,66} = 1.56$, $P = 0.21$, Fig 2a) or *Haematoptota* ($F_{1,66} = 0.6$, $P = 0.42$, Fig. 2b). However, the Epps Biting Fly Trap also caught a significantly greater number of non-biting insects, ($F_{1,66} = 40.89$, $P < 0.001$, Fig. 3) by a substantial margin. Birds were seen feeding on the flies in the Epps trap, so the numbers caught are almost certainly higher than given.

Conclusion

The Horse Pal biting fly trap is exactly what it says, a trap for catching horse flies. It evaluation on horse paddocks would be of value but falls outside the interests of EBLEX.

The Epps trap catches large numbers of insects, many of which do not affect animals. Whether it affects the numbers of flies on cattle in the field is not known,

Where next?

It would be of value to know 1) does the presence of the Epps trap reduce the numbers of flies landing on cattle in the field?, and 2) could it be used near the entrance to milking parlours to reduce or prevent flies entering the building?

Fig. 1. The mean (±95% confidence intervals) number of *Stomoxys calcitrans* caught per day by two different trap types at two farms in South West England between July and September 2008. Trap 1: Horsepal Biting Fly Trap; Trap 2: Epps Biting Fly Trap.

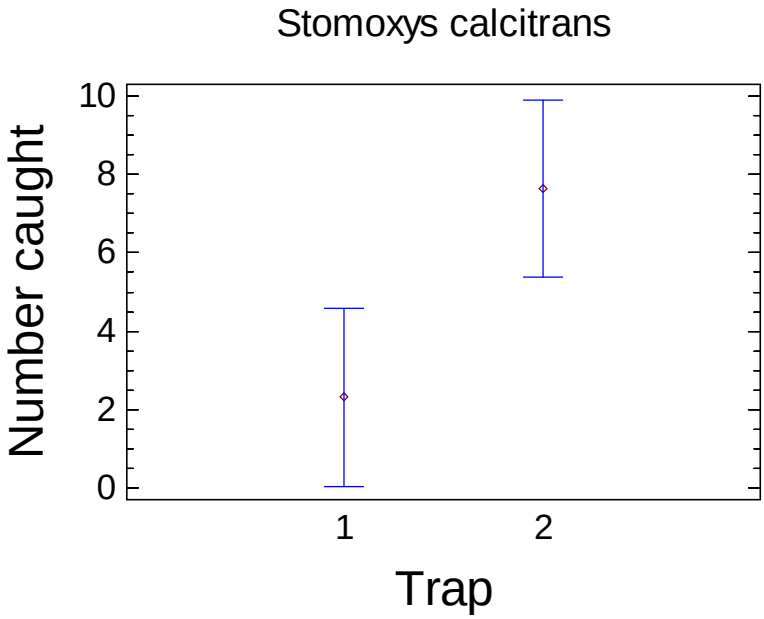
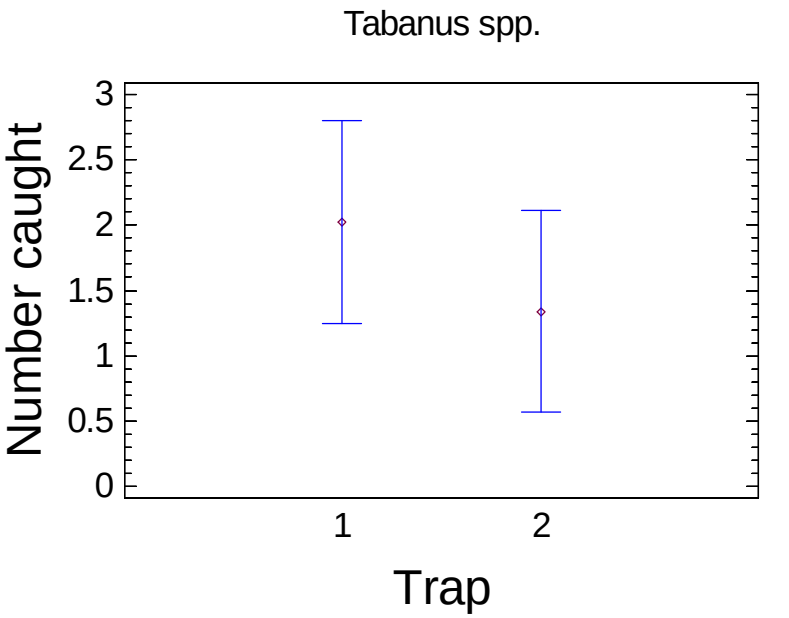


Fig 2. The mean (±95% confidence intervals) number of (a) *Tabanus* spp. And (b) *Haematopota* spp. caught per day by two different trap types at two farms in South West England between July and September 2008. Trap 1: Horsepal Biting Fly Trap; Trap 2: Epps Biting Fly Trap.



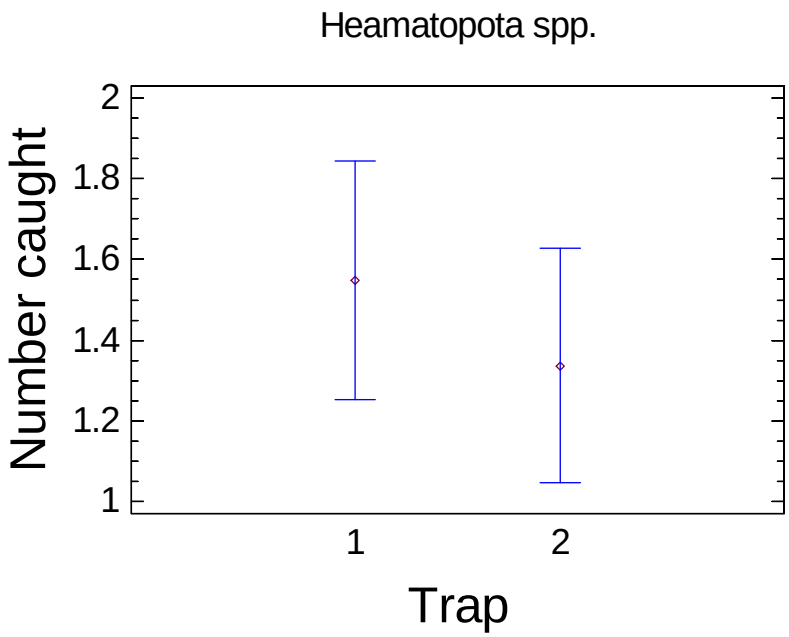
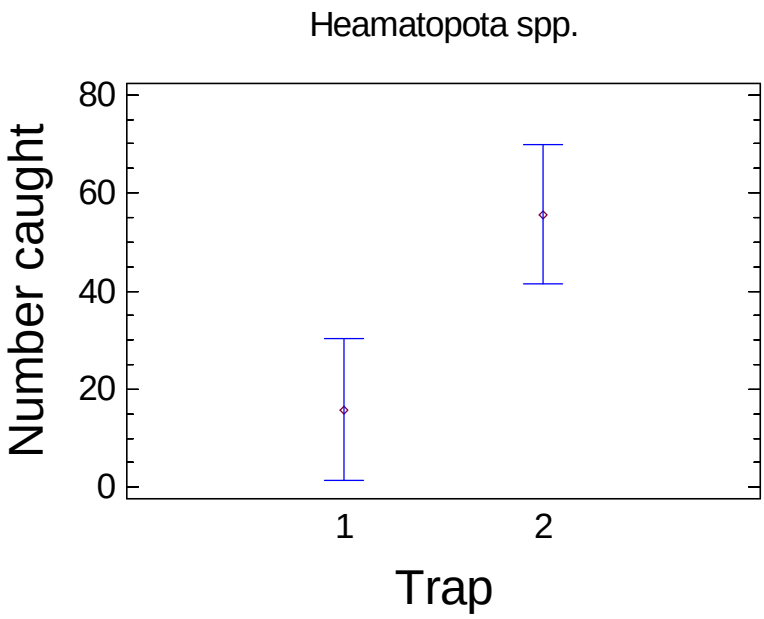


Fig. 3. The mean (±95% confidence intervals) number of other non-biting insects caught per day by two different trap types at two farms in South West England between July and September 2008. Trap 1: Horsepal Biting Fly Trap; Trap 2: Epps Biting Fly Trap.



Langford, Bristol, November 2008.