Flies

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Flying Pests

As soon as you mention flies, you automatically think of blowflies, but there are other flying insects that challenge sheep, including the head-fly and disease-carrying midges. All these flying pests challenge sheep and, even if they don’t kill, they’re irksome. A sheep constantly harassed by midges, or bothered by the itching caused by head-fly won’t concentrate on eating and so will lose condition.

Blowfly strike is the most serious problem, and if left untreated will lead to production losses and can cause agonizing death. As registered keepers of animals, farmers have a legal responsibility to prevent or treat infestations within their flocks. Failure to do so can result in prosecution for animal cruelty.

SCOPS have described blowflies as ‘the most widespread ecto-parasite affecting sheep in the UK, with surveys showing that every year 80% of flocks will have one or more cases
of strike’. Because of its prevalence, Eblex have recently launched a new ‘Prepare, Predict, Prevent’ campaign aimed at improving awareness of blowfly and its prevention.

**Economic Impact**

It’s not just welfare that is adversely affected by fly-strike. The economic impact is fourfold. It downgrades the wool clip; it also reduces reproductive potential and lamb crops; it increases time to market for lambs; and lastly it reduces leather quality. In a nutshell – it significantly affects your bottom line.

**The risk period**

Flies that over-winter in the soil as pupae emerge in the sprig when soil temperatures rise above 9°C. And with the warmer weather the risk period begins and blowflies begin to deposit many hundreds of eggs on to affected sheep. These hatch into larvae, which develop through three stages between egg and adult. The larvae have no mouthparts in its first stage, but as it progresses through stages two and three, the mouthparts are very active and feed constantly, damaging the sheep’s skin. The average lifecycle is 2-4 weeks. Blowflies strike unpredictably and randomly, causing terrible suffering and major losses in the UK flock. So shepherds must be vigilant, especially on those warm and sunny, showery and humid days between the beginning of March, even up to the end November.

As weather patterns have changed, the blowfly season has changed, too. Unpredictable weather makes early and late blowfly challenges a particular problem, and there is certainly evidence showing the risk season is getting longer every year. Breech strike depends less on weather and more on moisture levels around the back end; urine soaked fleeces or scouring will attract more flies, so this can occur outside the traditional ‘at risk’ periods.

**The Dreaded Blowfly**

There are three types of blowflies that affect sheep so look out for:

The **Green Bottle fly** (*Lucilia sericata*), which lays eggs on wounds or soiled areas, makes the primary strike. The moisture in these areas provides a perfect environment for larvae (maggots) to thrive. They hatch very quickly, sometimes in a matter of hours, and then they are very active, secreting an enzyme, which causes the skin to liquefy. They then eat into the flesh, causing extremely painful inflammation.
The **Black Blowfly** (*Phormia terrae novae*) and **Bluebottle** (*Calliphora erythrocephala*) do not make the first strike, but attracted by the smell of putrefaction, cash in on the damage already caused by the primary fly. They make the wound worse, putrefaction products create a secondary bacterial infection and if left untreated septicemia (blood poisoning) and toxemia cause a miserable death.

**Fighting blowflies**

The first line of attack is not to attract the flies in the first place. The prevalence of fly strike can be considerably reduced by improving farm management practices.

- Blowflies prefer a warm, moist and sheltered environment, so moving sheep to graze more exposed, less hospitable pastures can help reduce the risk of strike
- Keeping stocking densities low can help during the risk period
• The smell of wool grease, and the presence of foot rot, urine soaked wool, skin diseases, scour, or infected cuts attract blowflies to sheep. We need to make the sheep unattractive to flies, which mean keeping them free of ‘dirty’ wool and free of foot rot. The pungent smell of foot rot is like a magnet to a blowfly.

• Wounds should be treated immediately with something like Summer Fly Cream, which has repellent qualities. Remember that rams with head wounds from fighting are vulnerable, too

• Avoid nutritional upsets that will cause scouring

• Established strike lesions attract even more blowflies, so treating an affected sheep promptly will save her life. If you see a blowfly on a sheep, it’s probably been struck

• Keep your holding clean and tidy; addressing problem areas such as overflowing muck heaps and dirty pens can help reduce the risks. Sprinkling diatomaceous earth on your muckheap can help reduce the number of flies. And dispose of fallen stock quickly

• Shearing and routine crutching, especially during the worst periods of fly activity, will significantly decrease the likelihood of fly strike by reducing the attractiveness of this region to the gravid female blowfly. Shearing early will help prevent strike, but shelter must be provided in case the weather turns nasty. The risk increases as the fleece grows. Routine crutching will need to be done every four to six weeks

• Tail your sheep at the appropriate length if breed rules allow

• Check sheep with orf as this makes them more prone to strike

• Control of gastro-intestinal parasites may help prevent soiling of fleeces. Soiled sheep should be dagged

• Avoid breeding from sheep that are habitually struck and/or tend to soil themselves due to their conformation (ie those with deformed genitalia)

• Consider culling breeding ewes and rams that are continually struck, as evidence shows that hereditary factors may exist

• If you are going to use chemical insecticides, apply before the period of fly challenge.

What to look for

Flies are attracted by odours and decaying organic matter in the fleece, anywhere from the loins, shoulders, flank, neck, back, throat or abdomen, so don’t always assume that the problem is only found around the tail end.

Look out for the telltale signs of a strike - heads continuously twisting back, the body twitching in a shivering motion and the sheep spending periods of time rubbing on posts, etc. Sheep with strike will usually show some signs of distress, spending less time grazing and more time tail wagging, stamping their hind legs or biting the struck areas of the fleece they can reach. A wet patch, or stripes of discolored (dark) fleece, the stripes running from the top of the back down around the body sometimes just behind the front
legs; or in front of the hind legs, around the tail dock and in and around the hind legs, are all indications that the maggots are at work.

And be extra vigilant if you have dark-fleeced stock as it is more difficult to spot. Close daily observation will help you see a problem before it develops into a serious threat.

**Treating a strike**

Carefully cut away the wool in the affected area and you will find the maggots. Hosing with water or sitting the sheep in a bath will soon get the maggots pouring out.

Synthetic pyrethroid-based pour-ons (SPs) such as cypermethrin (Crovect & Ectofly) and deltamethrin (Spot-On) will cure existing infestations. Both Crovect and Dysect will treat and prevent. However, Spot-On offers no protection against further attack. They must be applied according the manufacturers recommendations with the correct applicator.

Blowfly Repel is a natural alternative for treating a strike - it effectively rids the animal of maggots, soothes irritated areas and promotes natural healing. It is fully HSE Approved and suitable for use in Organic Farming Systems. Made with pure and natural concentrated plant derivatives, it has soothing anti-bacterial and anti-fungal properties. Special oils help to moisturise the skin and keep it in good condition.

Battles Summer Fly Cream is a useful emollient cream for a healing strike and it is repellent, too.

A few drops of tea tree oil (TTO) in warm water can also be used to clean and debride the affected area. Tea tree is an extremely effective natural disinfectant as well as a repellent. Research in Australia showed that 1% solution of TTO gave 100% kill on 1st stage larvae, and a 2.5% solution killed most of 2nd and 3rd stage. After drying the area well, apply a mixture of Aloe Vera Gel with a few drops of tea tree oil, and then dust with sulphur powder. (NB TTO needs an emulsifier to be able to mix with water. Grapeseed oil can be used as a carrier).

A badly struck sheep will need a course of antibiotics (eg Betamox LA) to treat the systemic infection and pain relief (eg Metacam, a non-steroidal anti-inflammatory). To soothe and help heal the damaged skin, I have mixed a long-acting antibiotic such as Amoxypen LA (POM from your vet) in with the udder cream (50mls Amoxypen LA well mixed into 500 grams of udder cream; wear gloves to apply).

**Prevention is better than cure –but at what cost?**

Chemical insecticides containing growth regulators are very effective, but they are expensive and often unpleasant to handle. Some shearers won’t clip animals that have been treated with certain insecticides and wool processors are refusing wool that has been treated with organo-phosphates (OPs) or synthetic pyrethroids (SPs) because they are potentially dangerous to human health and to the environment. The Natural Fibre
Company, for example, won’t accept wool treated with OPs/SPs in the three months prior to shearing.

There is a wide choice of ectoparasiticides available with varying activity, which are categorised based on chemical structure and mode of action. Ectoparasiticides act either systemically - carried in the bloodstream - or topically, by direct contact with the target organisms. Systemic acting products may be given by injection or applied topically to the skin as pour-on or spot-on formulations, from which chemical compound is absorbed through the skin and is taken up into the blood. Most existing products act on the parasites’ nervous system.

Some groups, such as the organophosphates and synthetic pyrethroids, have broad-spectrum activity against ectoparasites. These chemicals are administered as either as dips, sprays, pour-ons, spot-ons or in ear tags. A diazinon-based plunge dip offers some level of protection.

If you do choose a chemical insecticide, Vetrazin is the least unpleasant to use, but it doesn’t treat a strike. Clik and Clikzin have a longer period of activity. Crovect, Dysect and Ectofly are effective strike treatments as well as being preventative. Each product has varying meat withdrawal periods to consider.

It is worth noting that Dysect stains the fleece green and is best not used on wool or a sheepskin-producing sheep as it’s almost impossible to wash out.

For pour-on products to work effectively, you need to apply them properly - with the appropriate nozzle, in the right places at the correct dose for the weight of the sheep. They are not all applied in the same way so read the instructions carefully. Try to spray in dry weather or at least allow a few hours for the application to dry.

Be safe not sorry

Consider Health and Safety issues and the Environment when using any chemical products. Make sure you wear protective clothing and gloves, and spray in a well-ventilated area. Don’t eat or drink whilst doing the job. And remember that disposal of empty containers or leftover products are subject to local environmental waste regulations. These chemicals are extremely toxic to aquatic life so avoidance of contamination of watercourses is essential.

Eco-friendly options

Keeping fly populations down generally on the farm can be difficult. The use of strong chemicals is one option, but there are a number of more eco-friendly preparations available which can help avoid the problems of flies.

One of the new generation of eco-friendly disinfectants is Accepta 8101 Biocide. Clean, safe and effective for the control of a wide variety of pathogens (all bacteria, viruses, fungi
and algae), it is approved for use in the UK. Its main constituent, hydrogen peroxide, eventually breaks down to non-polluting water and oxygen.

A homemade, eco-friendly disinfectant: mix \( \frac{1}{4} \) cup of Borax with a \( \frac{1}{2} \) gallon of hot water. Vinegar and baking soda are also excellent disinfectants. Another quick, easy, inexpensive and environmentally friendly disinfectant is a simple mixture of eucalyptus oil and water (1.6 oz of eucalyptus oil per litre of water). Shake well before use.

**More Natural Alternatives**

So what are the alternatives? There are some proprietary products available on the market now that are free of OPs and SPs, such as *Blowfly Repel for Sheep* which is specifically designed to repel biting and bloodsucking pests from sheep, including Blowfly, Ticks, Lice, Keds and other ectoparasites. It does however need to be reapplied every four weeks and even more frequently in very wet weather conditions. For more information and stockists visit [www.barrierbiotech.com](http://www.barrierbiotech.com).

So what else can we spray our sheep to keep away those blowflies? Various oils are naturally fly repellent, particularly tea tree oil, lavender, citronella, eucalyptus, camphor, peppermint, sandalwood and lemongrass. They can be mixed with a little washing up liquid and then diluted with water (3:1 ratio) and a splash of white vinegar. Apple cider vinegar (50/50 dilution with water) is said to be effective. As there is only anecdotal information on these remedies, trial and error is the way forward. Make sure you write down the recipe and record how effective it was and for how long it lasted. Vigilance with untested homemade products is essential to avoid a nasty strike.

Linseed Oil applied to the midline of the animal is also a very good fly repellent, but will linger in the fleece. If you are a wool producer, contact your processor to see how difficult individual oils are to scour.

Research into parasitic wasps for control of blowfly populations is in progress.

**Something even more attractive than a sheep’s behind**

How about putting something more attractive than a sheep’s behind near the field? Australian research has shown how a non-insecticidal blowfly trap significantly reduced the incidence of fly strike. And the volume of flies in the traps gives an early warning signal for shepherds to increase their fly strike monitoring and treatment efforts.

We tried using a synthetic bait product called *Red Top Fly Trap* and found it very effective if rather smelly. The trap is capable of catching up to 20,000 flies which, once trapped, can’t escape. The bait is especially appealing to female flies, breaking down the breeding cycle - so reducing the next generation. You simply hang the flytrap away from the area you wish to protect and the bait lasts up to 12 weeks. If you have sheep in several fields, you will need several traps.
Internal deterrent
As an internal fly repellent the addition of garlic to your sheep’s feed, either whole or in a molassed lick (Crystalyx do a garlic lick), causes the skin to secrete garlic-scented oils that deter flies. A dash of apple cider vinegar in the water trough changes the pH of the sheep’s blood making them unattractive to flies. And Crossgates Homeopathic Pharmacy offers a Fly Remedy which now includes Blue Tongue Virus Resonance and they sell Apple Cider Vinegar in large quantities. For further information see www.crossgatesfarm.co.uk.

Approximate comparative costs of Pour-on Treatments

<table>
<thead>
<tr>
<th>Product/Active ingredient</th>
<th>Quantity</th>
<th>Cost (ex VAT)</th>
<th>Period of activity</th>
<th>Dose</th>
<th>Meas with hold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vetazin 5% dicyclanil</td>
<td>2.2 litres 5 litres</td>
<td>£65.00 / £125.00</td>
<td>8-10 weeks Preventative</td>
<td>1ml/kg whole sheep 0.5mls/kg tail/crutch</td>
<td>28 days</td>
</tr>
<tr>
<td>*Crovect 1.25% cypermethrin</td>
<td>0.8 litres 2.2 litres 5 litres</td>
<td>£25.00 / £47.00 / £69.50</td>
<td>8 weeks Preventative &amp; Treatment</td>
<td>&gt;25kg: 20mls 25-40kg: 25mls &gt;40kg: 40mls</td>
<td>8 days</td>
</tr>
<tr>
<td>Clik 5% dicyclanil</td>
<td>0.8 litres 2.2 litres 5 litres</td>
<td>£49.00 / £88.00 / £150.00</td>
<td>16 weeks Preventative</td>
<td>10-20kg: 20mls 21-30: 25mls 31-50kg: 30mls &gt;50kg: 35mls</td>
<td>40 days</td>
</tr>
<tr>
<td>Clikzin 1.25% dicyclanil</td>
<td>2.2 litres</td>
<td>£85.00</td>
<td>8 weeks Preventative</td>
<td>10-20kg: 20mls 21-30: 25mls 31-50kg: 30mls &gt;50kg: 36mls</td>
<td>7 days</td>
</tr>
<tr>
<td>Ectofly 1.25% cypermethrin</td>
<td>5 litres</td>
<td>£56.00</td>
<td>8 weeks Preventative &amp; Treatment</td>
<td>&gt;25kg: 20mls 25-40kg: 30mls &gt;40kg: 40mls</td>
<td>8 days</td>
</tr>
<tr>
<td>Spot On 1% deltamethrin</td>
<td>250 mls 500 mls 1 litre</td>
<td>£33.00 / £58.00 / £93.00</td>
<td>Treatment of strike only</td>
<td>5 mls</td>
<td>35 days</td>
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<tr>
<td>Dysect 12.5g/l alpha-cypermethrin</td>
<td>5 litres</td>
<td>£64.00</td>
<td>10 weeks Preventative &amp; Treatment</td>
<td>&gt;25kg: 40mls &lt;25kg: 25mls</td>
<td>28 days</td>
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<tr>
<td>Blowfly Repel Natural ingredients</td>
<td>500mls 5 litres</td>
<td>£14.00 / £85.00</td>
<td>4 weeks (more often in wet weather) Preventative &amp; Treatment</td>
<td>Lambs 6 mls Sheep 24 mls</td>
<td>None</td>
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</table>

*Crovect actually only protects those parts of the sheep that are sprayed
**Alternatives**

Tea tree oil and Aloe Vera can be bought in larger quantities from Amphora Aromatics in Bristol - minimum spend for Trade Account applies;

Skin So Soft from Amazon – x 3 for £8.79 inc VAT +P&P;

White vinegar – very cheap from any supermarket;

Apple cider vinegar available from any good animal feed merchant (£25-£30 inc VAT for 5 litres) or if you live in the West Country from a cider maker;

Red Top Fly Traps – Amazon £4.50 - £5.00 inc VAT +P&P.

**Head-fly**

Head flies or plantation flies, *Hydrotaea irritans*, are non-biting flies that pester sheep and other livestock. This fly resembles the housefly and is 4-7 mm long. The thorax is black with gray patches, the abdomen is olive green and the wing bases are orange yellow.

Head flies are a nuisance to domestic animals and humans because they are attracted to the mouth, nose, ears, eyes, and wounds to feed on secretions. They are capable of overwintering. Adults are most active from early June until late September and are common in the vicinity of thickets or woodlands in which they shelter between periods of feeding.

Large swarms of flies, attracted by the movement of animals, congregate to feed on secretions from the eyes and nose and on the cellular debris at the grown horn base. To alleviate the persistent irritation, the sheep scratch and rub their heads, resulting in raw wounds on the poll. Flies, attracted by the blood, settle on these self-inflicted lesions and extend the margins by their feeding activity. Sheep of all ages are involved, but breeds with horns and without wool on the head are most severely affected.

**Treatment and Control**

It is difficult to control head flies by spraying breeding sites and resting habitats and treating the sheep has little value as the retention of organophosphate compounds or pyrethrin derivatives on the susceptible head areas is of short duration, which necessitates impractical re-applications in free-ranging animals. Spot-on (deltamethrin) is licensed for head fly but needs frequent application to be effective.

The answer is to completely remove stock from infested locations during the fly season to prevent damage in the first place. Once the skin is broken, housing is the only successful method, which allows healing to take place and stops further fly damage. Summer fly cream can be soothing and repellent if applied regularly.
Midges

With the threats of Bluetongue Virus (BTV) and more recently the Schmallenberg Virus (SBV), midges have become another real health issue. Vaccination is subject to availability and DEFRA/EU regulations.

Some sheep are suffering from midge allergy which, like sweet itch in horses, makes their lives miserable with the knock-on effect of ill-thrift – an animal bugged by flying insects won’t eat so well and will lose condition. They will rub themselves raw if they can.

Swish is a cattle product, but can be used off-licence in sheep; however, this means it does carry a statutory 28-day meat withdrawal. It contains deltamethrin. The dose rate is 10ml/60kg sheep and it is suitable for use on lambs. It must be applied directly to the skin, not just the fleece and needs to be reapplied every four weeks.

Avon’s Skin-so-Soft is an oily skin spray used extensively in Scotland during the midge season. For human use, some people swear by it, while others find it ‘useless’. Again, trial and error - see if it works for you. It can be mixed it with apple cider vinegar and water and applied with a garden sprayer onto the sheep, but it’s not long lasting and only practical to use if you have small flock and the time to pen them up and spray them regularly. Again the oil may linger in the fleece.

Another concoction to prevent biting midges: tea tree oil, chamomile extract and apricot oil. As with other homemade treatments, experimenting with ingredients/% mixtures and recording effectiveness is the only way to find an effective solution.

Sources

Information on Headily from the Merck website
SCOPS Information on Blowfly strike
EBLEX Prepare, Predict, Prevent campaign
Research by Peter J James RIRDC Dec 2008 Australia
Various farming articles