



IT'S FLY TIME! PREVENTING AND TREATING FLYSTRIKE

KEY POINTS

- Well-timed preventative strategies can help reduce the risk of flystrike and the development of fly waves and minimise the need for treatment.
- Some types and classes of sheep are more susceptible to flystrike and should be targeted for preventative activities and more carefully monitored in the lead up to, and during, high risk flystrike periods.
- An integrated preventative flystrike program includes breeding for flystrike resistance, the use of crutching or shearing, dag control, appropriate tail length, selection of less flystrike-prone paddocks, applying appropriate chemical treatments and killing maggots and removing sources of protein.
- Treating flystruck sheep is essential to protect the health and welfare of your sheep, prevent economic losses and break the lifecycle of flies.
- The prevention and treatment of flystrike should be included in a broader plan which also considers monitoring activities.

THERE ARE THREE BASIC CONDITIONS REQUIRED FOR FLYSTRIKE TO OCCUR:

1. PRESENCE OF SUSCEPTIBLE SHEEP;
2. PRESENCE OF FLIES; AND
3. FAVOURABLE WEATHER CONDITIONS TO ALLOW THE FLIES TO LOCATE AND INFECT THE SUSCEPTIBLE SHEEP.

WHEN IS THE FLYSTRIKE RISK HIGHEST?

Weather conditions play a big role in determining the risk of flystrike. The risk of flystrike is greatest during warm and wet conditions. This usually coincides with spring and autumn but it can occur throughout the year if climatic conditions make sheep more susceptible to flystrike and favour fly reproduction.

Blowfly activity increases when:

- the temperature is above 17°C - they are most active between 26°C to 36°C. Maggot development requires a temperature of 15°C;
- wind speeds are less than 9 km/h - fly activity stops when wind is greater than 30 km/h; and
- rainfall is regular and consistent - the strike risk increases dramatically when there is enough rain to keep the sheep's skin moist for two days or more.

Ongoing warm, wet weather or repeated rainfall cycles that coincide with the next generation of flies, will result in classic fly wave conditions. Repeated fly breeding cycles increase fly numbers with each cycle and when this coincides with an increasing number of susceptible sheep, the incidence of flystrike rises. Developing an annual plan that recognises and manages these risk factors is important.

During extended wet periods and or floods, sheep can get struck on the brisket and belly. Afterbirth also increases the risk of flystrike and is one of the reasons why lambing occurs in low-risk months.

The number of susceptible sheep is a key factor influencing the extent of flystrike in the mob. Sheep that are at greater risk of being struck by flies should be treated preventatively and carefully monitored during high-risk periods. Read more about monitoring activities in It's Fly Time! Recognising and monitoring flystrike, available at www.wool.com/flystrikeresources

WHAT MAKES SHEEP SUSCEPTIBLE TO FLYSTRIKE?

Sheep that are more likely to be struck by flies are those that have:

- breech skin wrinkles;
- dags caused by scouring;
- urine stain;
- long wool in the breech area;
- wool that is yellow;
- fleece rot and dermatitis (greater risk of body strike);
- wet or moist wool and skin;
- horns;
- wounds caused by skin tears, abscess, dog bites or foot rot etc.; and
- been struck in the past.



An example of extreme breech wrinkle and stain.

Source: Managing Breech Flystrike (2019), AWI



An example of body wrinkle in lambs.

Source: AWI

WHAT CAN I DO TO PREVENT FLYSTRIKE?

Selecting sheep which are less susceptible to flystrike is a good long-term strategy to minimise flystrike. This includes selecting for low breech wrinkle and wool cover and low incidence of dags and stain. Culling sheep which have previously been struck is also advisable.

The AWI and Meat & Livestock Australia publication Visual Sheep Scores is a useful tool to help select and cull sheep.

Short-term preventative activities which help reduce the risk of flystrike include:

- shearing or crutching to remove wool and dags;
- tail docking to the optimal length when marking lambs;
- applying preventative chemicals to sheep to protect against strike;
- reducing the risk of scouring which causes dags; and
- careful selection of paddocks.



Shearing sheep reduces wool length so flystrike prone areas dry quickly.

Source: Managing Breech Flystrike (2019), AWI

SHEARING AND CRUTCHING

Shearing and crutching are effective preventative activities which reduce the occurrence of attractive dags and urine stain and to reduce wool length so the breech area dries quickly.

Shearing and crutching can provide up to six weeks protection from body and breech flystrike. If sheep are scouring, this protection may be reduced to three weeks.

Shearing or crutching should be planned to coincide with the start, or just before the usual start of the fly season. This is particularly important for lambing ewes that may have more stain around their breech.

Carefully consider the timing of shearing and crutching. Aim to extend the period of protection over the fly season as much as possible by 'spacing' out these activities, bearing in mind the usual high-risk periods for flies in your area.

TAIL LENGTH

When marking lambs, ensure tail length is appropriate to minimise stain around the breech and reduce flystrike risk throughout the sheep's life. The recommended tail length for ewes is to ensure the healed tail just covers the vulva. This means docking immediately below the third palpable joint or through the third joint space. Male lambs should have their tails docked to the same length as ewe lambs.

This is the optimal length to help the animal when lifting their tail to channel urine and faeces, away from breech wool. It also helps to prevent prolapse (common in sheep with very short tails) and protects soft tissue from cancers caused by sun exposure.



Crutching sheep reduces dags and urine stain which attract flies.

Source: Dealing with Dag Factsheet (2019), AWI

APPLYING PREVENTATIVE CHEMICALS

Insecticides can be used in combination with other preventative activities to deter flies but they shouldn't be relied upon alone.

These chemicals are registered to be used as either a preventative measure or to treat struck animals (as 'dressings'). Some chemicals only provide protection and will not kill older maggots.

Wool length can impact the effectiveness of preventative chemicals. It is vital you use the right chemical for the task, consider wool length in your chemical selection and follow the label instructions.

Where possible, time applications to extend the protection period. For example, if you shear in early December, applying a preventative chemical six weeks later in mid-January can help to protect the sheep.

Use the FlyBoss Lice and Flystrike Product [www.flyboss.com.au/sheep-goats/treatment/products.php] tool to work out the most appropriate preventative chemical for your situation.

When considering a chemical treatment check for withholding periods and intervals. Keep accurate records of any chemical treatments used.

REDUCING THE RISK OF SCOURING

Scouring can cause dags to form rapidly. Dags can then cause the wool and skin around the breech to stay moist and warm, providing a suitable site for female flies to lay eggs and for maggots to develop.

Preventing scouring and dags is an important step to reduce the risk of breech flystrike. Several species of internal parasite cause scouring while others, such as *Haemonchus* or barber's pole worm, do not. Monitoring the populations of worms which cause scouring using faecal egg counts and drenching when required can help reduce the risk of scouring.

It is also important to avoid sudden changes in diet that may induce scouring such as the introduction of grain or forage crops.

It is much easier to crutch and remove dags on low breech wrinkle sheep.

CAREFUL SELECTION OF PADDOCKS

Most properties have paddocks where sheep are at higher risk of flystrike (for example protected creek paddocks or wet flats) and others where the risk is lower (for example, exposed paddocks with less ground cover, timber and wet areas, where sheep dry out rapidly and fly activity is low). A possible option during periods of high flystrike risk is to avoid the hotspots that encourage fly activity by moving high-risk flocks to the exposed paddocks.

Avoid paddocks that may be contaminated with a large population of scouring worm larvae (for example, those that have been recently grazed) during the fly season. This can help prevent scouring.

WHAT CHEMICAL DRESSING SHOULD I USE?

Dressings kill maggots on struck sheep and can help prevent re-strikes while the wound dries out and heals but may only provide protection for a relatively short period of time.

The active ingredients in registered dressings are:

- ivermectin;
- cyromazine;
- spinosad; and
- diazinon.

Use the FlyBoss Lice and Flystrike Product

[www.flyboss.com.au/sheep-goats/treatment/products.php] tool to work out the most appropriate dressing for your situation.

When considering a dressing, check for withholding periods and slaughter intervals. Keep accurate treatment records.



An example of sheep with dags.

Source: Dealing with Dag Advisor Manual (2019), AWI

No single prevention or treatment strategy should be relied upon alone. Make sure you use a range of well-timed strategies in combination.

HOW DO I TREAT A FLYSTRUCK SHEEP?

Once flystruck sheep have been identified, treatment should occur without delay. Find more details on identifying flystruck sheep in *It's Fly Time! Recognising and monitoring fly-strike* from www.wool.com/flystrikeresources/

Remove struck wool by clipping the wool on and around the infected area. Clip the wool close to the skin. Machine shearing is generally easier and faster than using hand shears.

1. Clip away at least 5 cm of clean wool around the struck area. This allows infected skin to dry out and exposes maggot trails.
2. If maggot trails are evident, follow these and clip out all infected wool.
3. Place clipped wool into a plastic bag that can be sealed. Leave the bag in the sun for several days to kill the maggots.
4. Dress the infected area using a suitable registered chemical to prevent the wound from being re-struck while it is healing.
5. Move struck sheep to a 'hospital' paddock (if possible) to reduce the risk of attracting more flies to the rest of the flock. Provide them with fresh feed and water, shelter and contact with other sheep, and monitor them regularly.

Make sure you follow all the steps described above to effectively treat the struck sheep and to prevent additional flystrike.

An 'integrated pest management' approach using both chemical and non-chemical options is important to reduce the future risk of flystrike.

HOW CAN I SLOW THE DEVELOPMENT OF CHEMICAL RESISTANCE?

The resistance of flies to preventative chemicals and dressings is a growing concern, as resistance reduces the effectiveness of treatment. That is why it is important to:

- follow the label instructions for dosage rates and application methods;
- not overdose or underdose;
- ensure full coverage as per label instructions;
- rotate chemicals where possible; and
- calibrate application equipment regularly.

Preventative and dressing chemical treatments should be used in combination with other measures and shouldn't be relied upon alone.

HOW CAN I REDUCE FLY NUMBERS AND THE RISK OF ADDITIONAL STRIKE?

The Australian sheep blowfly (*Lucilia cuprina*) female will lay eggs on a range of protein sources, including dead sheep and rubbish but it is those eggs laid on live sheep which have the greatest chance of surviving due to limited competition (predation) from the maggots of other fly species. Within 12-24 hours, the eggs hatch into maggots (larvae) which grow by feeding on the sheep through wounds, existing strikes and weeping skin.

The maggots drop off the sheep after about three days and burrow into the ground to pupate before emerging as immature flies about a week later, depending on temperature.

To complete their lifecycle, female adult flies must have access to feeds rich in protein for their reproductive organs to develop and then again to produce eggs.

The sources of protein that female adult flies may use include exudate (weeping) from wounds, existing strike, weeping skin (possibly associated with dermatitis), carcasses, household waste and protein-rich manure.

Other fly species that can cause secondary infections may also use these sources of protein (including carcasses, animal and household waste) to lay eggs and to hatch maggots.

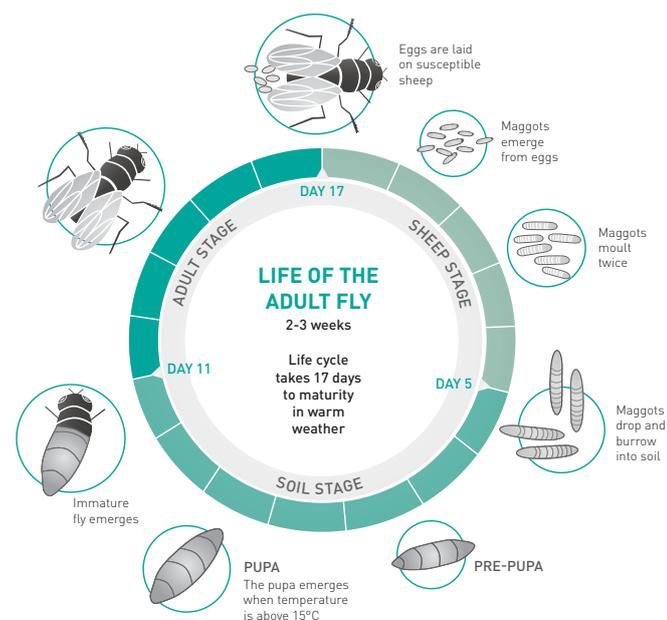
It is important to remove and dispose of any fleece or waste animal matter (dags, dirty wool pieces, horn tips, tails, etc.) and where possible carcasses to eliminate these as a source of protein for both the Australian sheep blowfly and other flies.

Many maggots may escape dressing applications and they can then contribute to the next generation of flies. Maggots that have been exposed to a chemical treatment but that are not killed can also contribute to chemical resistance over time, so it is important that they do not breed. Collect as many maggots as possible during treatment and seal them in a plastic bag to be killed. Maggoty wool should not be swept out the door of the shearing shed or down the chutes as this can contribute to increased fly numbers.

Any maggots or maggoty wool collected from struck sheep should be sealed in a plastic bag and left in the sun for a few days to ensure the maggots are dead.

Carcases of sheep that have died from flystrike should also be removed as many maggots may be able to complete their development before other fly species infect the carcase and compete with them.

Flies do not generally travel far so managing them at a property level can make a significant difference to the incidence of flystrike on individual properties and in the local area.



The lifecycle of *Lucilia cuprina*, the Australian sheep blowfly
Source: Levot (1999) from *Managing Breech Flystrike* (2019), AWI

READ THE OTHER IT'S FLY TIME! FACTSHEET

Access It's Fly Time! *Recognising and monitoring flystrike* from <https://www.wool.com/globalassets/wool/sheep/welfare/breech-flystrike/its-fly-time/accordion-3/gd4108-awi-its-fly-time---recognising-and-monitoring-flystrike.pdf>

FURTHER INFORMATION

Managing breech flystrike (AWI) www.wool.com/globalassets/wool/sheep/research-publications/welfare/non-invasive-management-practices/gd2428-2019-managing-flystrike-manual_11.pdf

Visual sheep scores (AWI and Meat & Livestock Australia) www.wool.com/globalassets/wool/sheep/welfare/breech-flystrike/breeding-for-breech-strike-resistance/visual-sheep-scores-producer-version-2019.pdf

Managing flystrike and lice: A practical guide for farmers (Beef & Lamb NZ) beeflambnz.com/knowledge-hub/PDF/managing-flystrike-and-lice

FlyBoss Lice and flystrike product tool www.flyboss.com.au/sheep-goats/treatment/products.php

FlyBoss Flystrike quick tools www.flyboss.com.au/sheep-goats/tools/flystrike-quick-tools-online.php

FlyBoss Seasonal conditions and geography www.flyboss.com.au/sheep-goats/susceptibility/seasonal-conditions-and-geography.php

FlyBoss Tail length www.flyboss.com.au/sheep-goats/management/tail-length.php

FlyBoss Treatment of struck sheep www.flyboss.com.au/sheep-goats/treatment/treatment-of-struck-sheep.php

Tail length in unmulesed Australian Merino sheep (J Lloyd, Report for AWI) www.wool.com/globalassets/wool/sheep/research-publications/welfare/2012-rd-update/2012-awi-rde-tech-update-j-lloyd-tail-length.pdf

Livestock Factsheet – Flystrike (Victorian Farmers Federation) www.vff.org.au/wp-content/uploads/2020/12/Factsheet_Livestock_Flystrike.pdf

The biology and ecology of the Australian sheep blowfly (Wiedemann) – an update (KG Wardaugh, proceedings from the FLICS Conference) www.licebosstools.org.au/FLICS/PDFs/Chapter_2/Wardaugh_Lucilia_biology_and_ecology.pdf