

Fly Control in Sheep Technical Guide



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Flies and Flystrike: An overview

Flystrike is the most important ectoparasitic disease of sheep in New Zealand. It is estimated that 2-10% of the national flock is affected by flystrike annually¹.

The normal flystrike season occurs from November to March, although this will vary slightly between areas.

Flystrike causes pain to the animal and is a significant welfare and production concern. Signs in sheep include irritation (stomping, rubbing or biting the affected area), shade seeking, depression, and lack of appetite.

Rapid weight loss occurs once maggots establish, and reproductive performance can also be impacted. Death can occur in severe cases. Struck animals should be treated immediately to prevent further suffering.

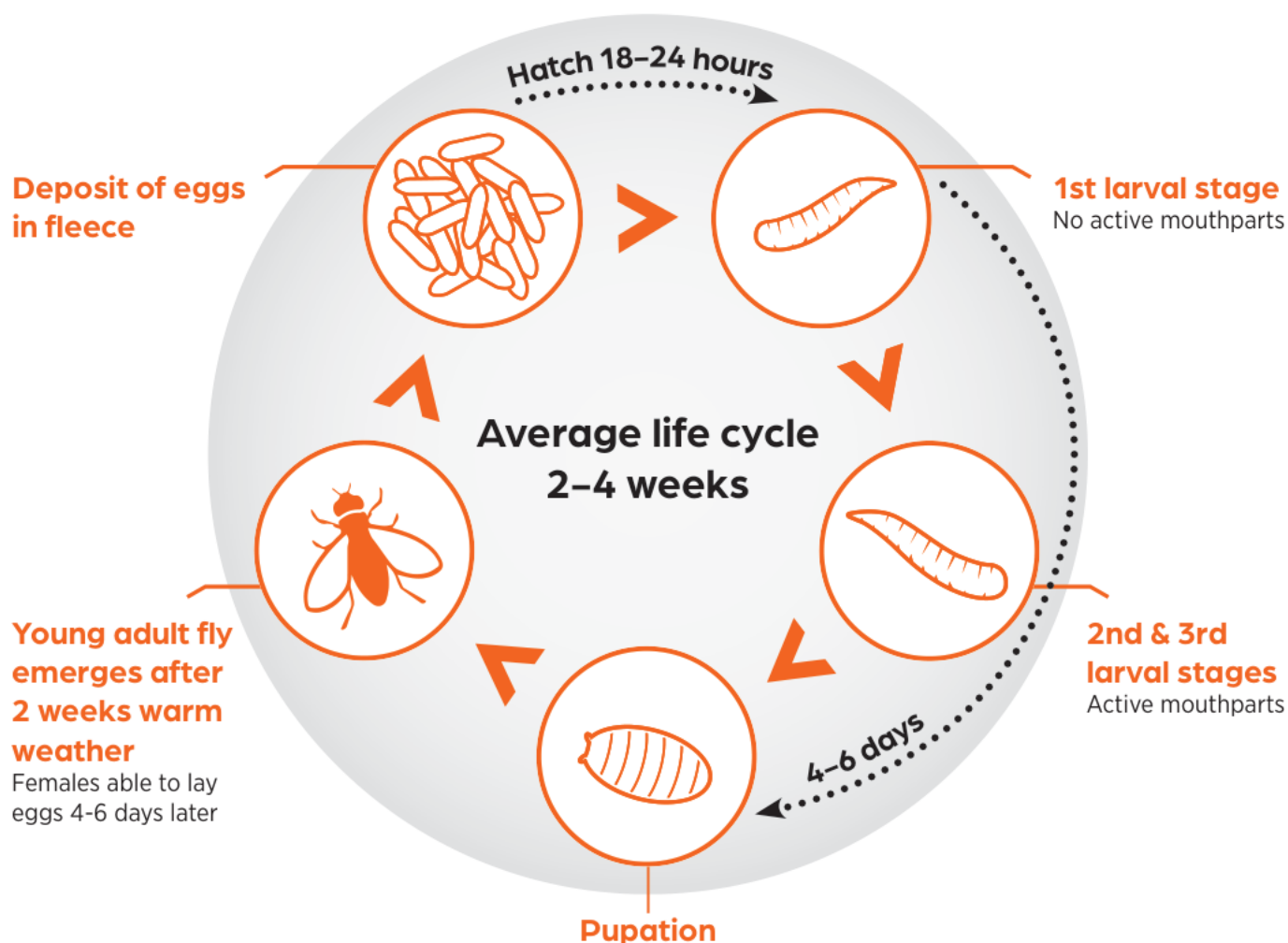


Key species of blowfly that can cause flystrike in New Zealand sheep, in order of prevalence, are:

- *Lucilia cuprina* (Australian green blowfly) (nearly half of all strikes are caused by this species)¹
- *Lucilia sericata* (common green blowfly)
- *Calliphora stygia* (brown blowfly)
- *Chrysomya rufifacies* and other *Calliphora* spp (secondary invaders).



The Fly Lifecycle



Fly development and breeding occurs in calm, warm, moist conditions and generally needs a ground temperature of over 15°C for pupae to emerge.

Adult female blowflies look for places to lay their eggs and are attracted to smells from the sheep. Predisposing factors include damp wool, dags and urine staining around the crutch, fleece rot and dermatitis, footrot, head injuries in rams, infected or open wounds, and wrinkled skin (merinos).

Blowflies lay their eggs, approximately 200 per time, in moist sites close to the sheep's skin where maggots are most likely to survive.¹

Eggs hatch into first stage larvae 18-24 hours after being laid. By the second and third larval stages (maggots), the maggots have active mouthparts and begin to 'feed' on the sheep, causing injury by burrowing through the skin and secreting acidic digestive juices which 'burn' the tissues. This 'burn' is the active flystrike, and the feeding period can last three – seven days per maggot.

Maggots then drop to the ground and burrow into the soil and become dormant pupae where they can stay for prolonged periods (e.g. Winter). When soil temperatures warm back up, the adult fly emerges, and the cycle continues.

Managing Fly Strike

Reducing the risk of fly strike on farm requires a strategic, whole-farm integrated parasite management plan, combining non-chemical and chemical methods of control.

Non-chemical Control

Methods of non-chemical control include both short-term and long-term strategies. Implementing the following strategies can help reduce risks to sheep.



Shear and crutch prior to high risk times

Removing fleece can prevent flystrike for about 4 weeks.



Reduce dags

Sudden changes of diet, and gastrointestinal parasite burdens can lead to scouring, creating dags. Dags attract flies to the breech area, and provide the fly eggs with an optimal environment to hatch and develop through the larval stages.



Tail modification

Tail docking reduces the risk of fly strike. Long tails or those docked too short are more likely to lead to contamination of the tail or breech area with urine and faeces and hence be more prone to being struck.



Genetics

Actively selecting replacements based on certain traits (e.g. dag scores, fleece rot and breech cover) can help to reduce the risk of flystrike. Rams can also be ranked and selected based on their EBV for dag score.

Chemical Control

A number of chemical options are available to prevent fly strike.

Chemical Group		Chemical Active
TPD IGR	Triazine and Pyrimidine Derivative Insect Growth Regulator	Dicyclanil, Cyromazine
BPU IGR	Benzoyl Phenyl Ureas Insect Growth Regulator	Diflubenzuron, Triflumuron
ML	Macrocyclic Lactone	Abamectin, Ivermectin
NN	Neonicotinoid	Imidacloprid
OP	Organophosphate	Temephos
SPIN	Spinosyn	Spinosad
SP	Synthetic Pyrethroid	Cypermethin, Alphacypermethrin, Deltamethrin

Table 1: Chemical groups and their active ingredients used for the prevention and treatment of flystrike.



Many of the chemicals have significant fly resistance to them. These include the BPU IGR's, and the Organophosphates. The most effective actives for fly strike prevention are TPD IGRs that work to stop the fly larvae from developing into the next stages. The result is the death of the larvae, and with early season treatment just before the annual risk period, the overall effect is a reduction in the fly population on farm.

When choosing a chemical option farmers need to think about many factors including method of application, length of protection, ease of use, flexibility and withholding periods.

StrikeForce®-S

Spray-On Sheep Blowfly Treatment

StrikeForce-S is a ready to use spray on blowfly treatment. It has a unique, patented solution formulation containing dicyclanil, the most effective active in the prevention of fly strike².

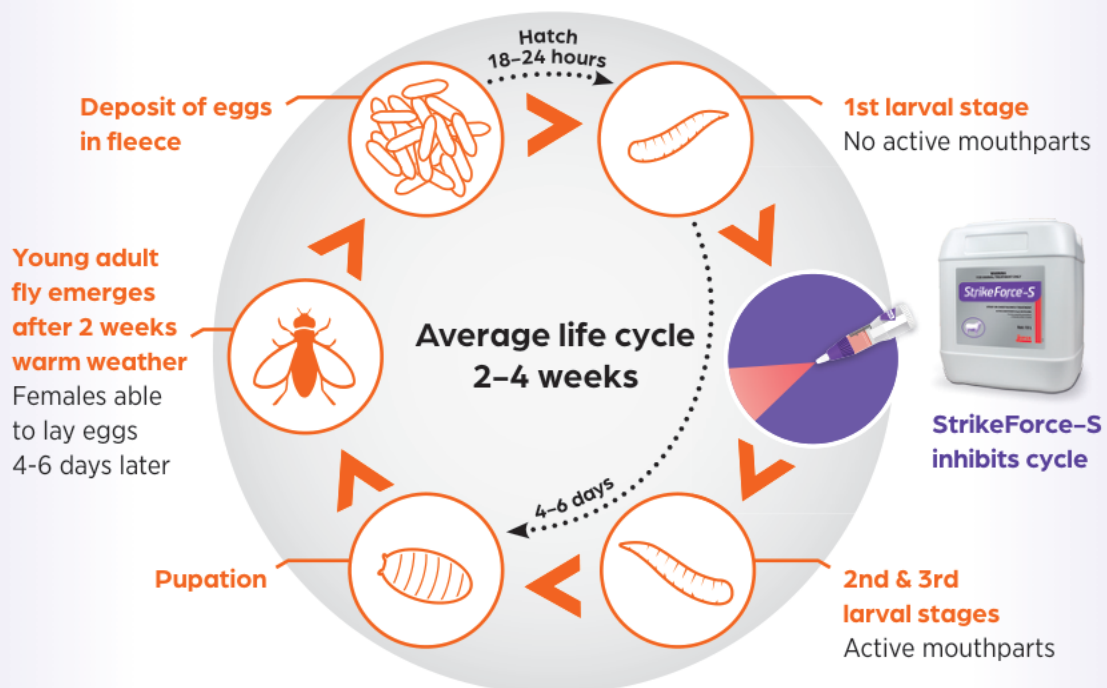
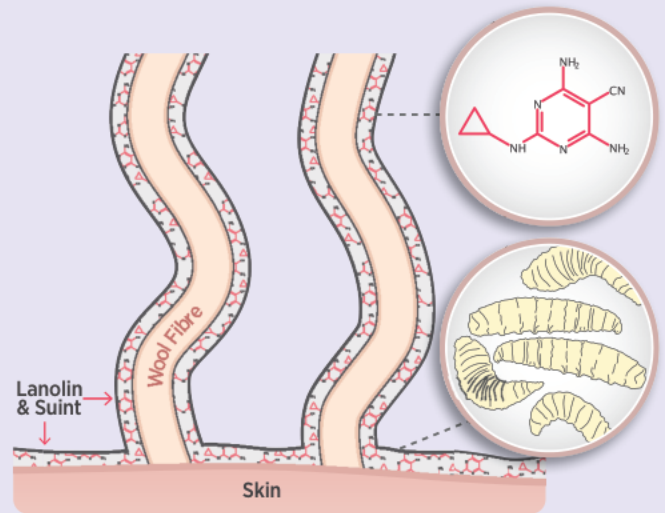
Active Ingredient: Dicyclanil 50g/L

Efficacy against:

Flystrike caused by all the commonly found strike flies including the Australian blowfly (*Lucilia cuprina*).

Unique Solution Formulation

- Hydrophilic (water-soluble) and lipophilic (fat-soluble) components in a solution allows for rapid dispersion in the fleece.
- Lipophilic components minimise washing off of the active during periods of rainfall.
- On application of StrikeForce-S, dicyclanil distributes into the lanolin and the suint, where blowfly larvae feed.
- The first stage larvae feed on the suint and lanolin which lies on the surface of the skin, and the first few millimetres of the wool fibre. It is here that they take up the dicyclanil which inhibits their ability to develop into the next larval stage, breaking the life cycle, and stopping the maggots causing damage to the fleece and sheep.



Efficacy data

Field trials conducted in Australia demonstrate the high efficacy of StrikeForce-S over an 18 week period³.

- 18 sites were monitored throughout sheep areas in Australia. Flystrike was observed at 9 of these sites.
- Each site comprised 300 animals, with 100 each either untreated controls, StrikeForce-S or CLiK™ treated animals.
- Fly presence was measured by incidence of flystrike in untreated controls
- StrikeForce-S and CLiK were demonstrated to be equally effective at the prevention of blowfly strike.

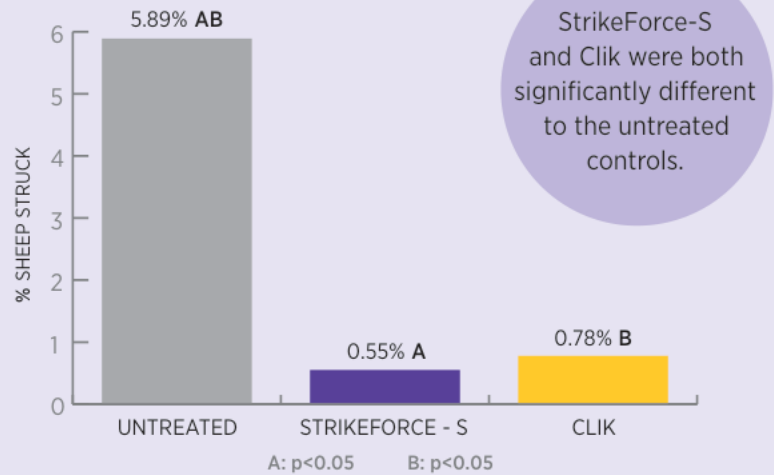


Figure 1: Mean flystrike percentage for 9 sites where flystrike was observed.

Effects of Rainfall

The unique formulation allows lipophilic components to bind to the fleece, resulting in the active staying in the fleece during periods of rainfall. This means that dicyclanil stays on the sheep, protecting it from blowfly strike, for up to 18 weeks.

In both real life conditions and simulated rainfall testing StrikeForce-S still delivered high concentrations of dicyclanil in the lanolin and suint where the larvae are active.

Concentration of StrikeForce-S in wool after rainfall³



Figure 2: Concentration of Strikeforce-S in wool after rainfall.

Application

- StrikeForce-S is highly visible. The red formulation is easy to see, allowing for accurate application and identification of treated animals.
- The red colour easily washes out of clipped wool during the scouring process.
- Use of a 15mL applicator with fan tip nozzle is recommended.
- Application in the presence of rain or before heavy rain is not recommended.

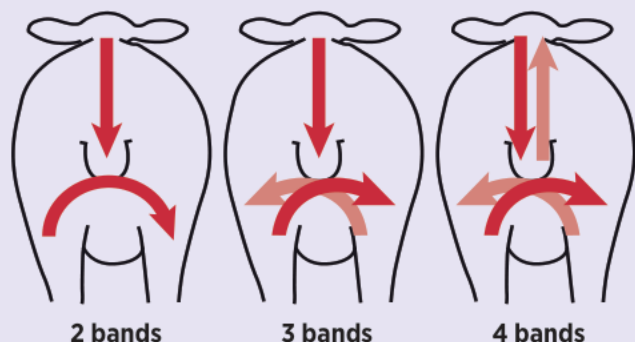


Figure 3: Ewe hoggets treated with StrikeForce-S (red) and Clik (pale pink).

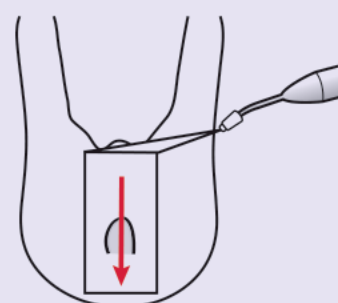
Dose Table for StrikeForce-S Spray-On Sheep Blowfly Treatment

Bodyweight (kg)	Dose Volume (mL)	Bands x Volume in each (mL)
10 - 20	20	2 x 10
21 - 30	25.5	3 x 8.5
31 - 50	30	3 x 10
> 50	36	4 x 9

- When applying StrikeForce-S the nozzle of the applicator gun should be high enough above the fleece (approximately 15 – 25cm), to achieve a 15cm wide band at each pass for protection of body strike.



- For treatment of docking/tailing wounds, apply between 5mL and 10mL over the crutch ensuring that sufficient product is applied to cover the area to be protected. The band must be wide enough to cover the wound and 25mm onto the surrounding wool.



Suitable for all Classes of Sheep

The smart choice for lambs

- Use at docking/tailing to protect from flystrike during the wound healing process.
- The short meat withholding period of 14 days provides flexibility to send lambs for processing.

Protection for ewes and ewe replacements

- Anecdotal evidence strongly suggests that ewes or ewe hoggets that get struck are very unlikely to get in lamb¹. Long-term protection against flystrike is preferable, particularly prior to and during mating.

Safety

Safety studies conducted at three times the dose (3X) and 3 consecutive monthly treatments at the normal dose rate, resulted in no abnormal findings.

Withholding Periods: Meat 14 days; Milk 35 days

Wool Residues: Ensure the time between treatment and subsequent shearing is at least two months.

Pack Size: 5L, 15L

StrikeForce-S[®]

SPRAY-ON SHEEP BLOWFLY TREATMENT



REFERENCES: 1. Ectoparasites of sheep in New Zealand and their control, NZVA, 2019. 2. Bowen FL et al (1999) Long-lasting prevention against blowfly strike using the insect growth regulator dicyclanil, Aust Vet J, 77(7): 454-460. 3. Data on file. 4. Levot GW (2012) Cyromazine resistance detected in Australian sheep blowfly, AVJ, 90 (11):433-437 5. NSW DPI lawi/Levot 2014, A National breech strike R&D technical update.

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