

# INSECTICIDE RESISTANCE STRATEGY TO MAXIMISE FLYSTRIKE CONTROL

It is vital that sheep producers prudently manage their use of flystrike insecticides, to maintain protection for their flocks and slow the development of resistance within their local fly populations. Producers should follow the eight-step strategy below, developed by AWI's Sheep Blowfly Resistance Management Strategy Working Group.

## KEY POINTS

- The Australian sheep blowfly has demonstrated a capacity to develop insecticide resistance to a variety of insecticide groups, reducing their effectiveness.
- There are only a limited number of insecticides registered against flystrike so increasing insecticide resistance will have a significant impact on the industry.
- There is an urgent need for sheep producers to strategically manage the use of insecticides to maximise flystrike control and to maintain the efficacy of available products on their property.

There have been a number of confirmed cases of the Australian sheep blowfly having developed some resistance to insecticide treatments, with some sheep producers having noticed shorter protection periods than claimed on the label of the flystrike products they have used.

This is a timely reminder for sheep producers to implement strategies to manage insecticide resistance. There are only a small number of chemical groups registered for flystrike control, so it is important to prolong the useful life of these insecticides on your property for as long as possible.

"Without access to effective preventative insecticide treatments to control flystrike, sheep producers would be more reliant on mulesing, crutching and continual surveillance of flocks followed by manually clipping and dressing of wounds," explained AWI General Manager for Research Dr Jane Littlejohn.

"By implementing resistance management strategies, sheep producers can slow the development of resistance, which will help increase the effective life of registered insecticide products."

AWI's Sheep Blowfly Resistance Management Strategy Working Group

members have developed the following eight steps for sheep producers to follow to slow the development of resistance.

### 1. USE AN INTEGRATED APPROACH TO REDUCE RELIANCE ON INSECTICIDES

- Breed for resistance to all types of flystrike: poll, pizzle, body and breech (breeding for polled animals; low wrinkle, cover, urine stain, dags; and white wool colour. Cull struck sheep).
- Shear or crutch at times that maximise protection against flystrike.
- Dock tails to the correct length.
- Manage sheep to minimise scouring.
- Use breech modification if required, until sheep are genetically resistant to flystrike.
- Use chemicals sparingly.
- Where the above approaches are insufficient, mules with pain relief.

### 2. KNOW YOUR CHEMICAL GROUPS

- Insecticides used for flystrike control fall into different groups or chemical families; see Table 1 below.
- Flies resistant to one insecticide in a particular chemical group are likely to be resistant to other insecticides in the same group.

- Different flystrike products may contain the same chemical or a related chemical from the same chemical group. When looking for alternatives, change to a different chemical group, don't just change insecticide brands.
- Use the FlyBoss Fly and Lice Products Tool at [www.flyboss.com.au/tools/products.php](http://www.flyboss.com.au/tools/products.php) to search for flystrike products, determine their chemical group and make your selection.

### 3. ROTATE CHEMICAL GROUPS WHERE PRACTICAL

Insecticide choice should be tailored to your particular location and management.

- Consider rotating insecticide products from different chemical groups to slow the development of resistance.
- Use a different chemical group for treating struck sheep to that used for flystrike prevention.
- Successive treatments within the fly season should generally be different chemical groups.
- Choose a product with the appropriate protection period and time of application.
  - A product that provides a shorter period of protection may be sufficient in some instances. For example, when sale of sheep or lambs for slaughter is imminent, when sheep are soon to be crutched or shorn, or when close

**Table 1. Chemical groups and actives available for flystrike control and their application methods**

CHEMICAL GROUP	CHEMICAL ACTIVE	APPLICATION METHOD <sup>1</sup>			
		Spray-on	Jetting	Dipping	Dressing
Insect Growth Regulator (IGR)	Cyromazine	Yes	Yes	Yes	Yes
	Dicyclanil	Yes	No	No	No
Neonicotinoid	Imidacloprid	Yes	No	No	No
Spinosyn	Spinosad	No	Yes	No	Yes
Macrocyclic Lactone (ML)	Ivermectin	No	Yes	No	Yes
Synthetic Pyrethroid (SP)	Alpha-cypermethrin <sup>2</sup>	Yes	No	No	No
Organophosphate (OP)	Diazinon, Propetamphos & Chlorfenvinphos	No	No	No	Yes

<sup>1</sup> Always follow label directions

<sup>2</sup> Registered for prevention of body strike only

monitoring of sheep is not possible for a short period because of other farm tasks or holidays.

- The Flyboss Fly and Lice Products Tool can help you select a chemical group that will provide the length of protection that is required.

#### 4. MINIMISE THE NUMBER OF INSECTICIDE TREATMENTS APPLIED IN A SEASON

- Optimise the timing of treatment to provide full protection during high risk periods.
- Utilise other management strategies, such as shearing and crutching, to minimise the length of time flies may be exposed to inadequate levels of insecticides on the sheep. However, ensure that you abide by wool harvesting intervals so that there are no unacceptable chemical residues in the wool.

#### 5. CONSIDER TREATMENTS FOR OTHER PARASITES, PARTICULARLY LICE TREATMENTS

- Exposure to insecticides used for treatment of other parasites (particularly lice) can contribute to resistance selection in blowflies, and vice versa.
- Where possible, use a different chemical group to treat flies and lice.
- Aim to eradicate lice and avoid the need for lice treatments.

#### 6. APPLY INSECTICIDES CAREFULLY AND STRICTLY AS SPECIFIED ON THE LABEL

- Shorter protection periods are often due to poor application, not resistance. Be sure to apply insecticides carefully according to the label instructions.
- Poor application can expose flies to sub-lethal levels of insecticides; this can contribute to an increase in resistance.

#### 7. MONITOR FOR FLYSTRIKE FREQUENTLY

- Check every 2-3 days during high risk periods to identify struck sheep early.
- Treat sheep and kill maggots before they become larger and are harder to kill.
- Record when strike occurs in relation to preventive treatments.
- Notify the product manufacturer if you suspect resistance.

#### 8. COLLECT AND KILL ALL MAGGOTS FROM FLY STRUCK SHEEP

- Place maggots and shorn wool into a sealed plastic bag and leave in the sun so the maggots are killed.
- If maggots are not collected or destroyed the most resistant ones can burrow into the soil, complete development and contribute to the next generation of flies.

## ARE SHORTER PROTECTION PERIODS ALWAYS BECAUSE OF RESISTANCE?

In cases where flystrikes are occurring earlier than expected based on the protection period on the product label, you should first rule out other causes of reduced protection:

- The individual sheep did not receive a treatment.
- Treatment was applied, but incorrectly.
- Wool length was too short at application time.
- Soiled or lumpy wool.
- Seasonal rainfall has been excessive and washed some chemical out of the treated area.

AWI's Sheep Blowfly Resistance Management Strategy Working Group, who contributed to the development of this eight-step strategy are: Brian Horton (University of Tasmania), Peter James (University of Queensland), Deborah Maxwell (ParaBoss), Jane Morrison (MSD Animal Health), Bridget Peachey (AWI), Nick Rolls (Elanco) and Narelle Sales (NSW Department of Primary Industries). **B**

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