



Sheep lice – selective chemical treatments

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Introduction

Sheep lice are a significant economic problem to wool producers. Severe infestations can result in considerable fleece damage. Lice reduce the fleece weight and wool quality but not fibre diameter. Several studies have shown that over a 12 month period the clean fleece weight may be reduced by 0.2 to 1 kg, depending on the level of infestation. The cost of treatment is considerable, so a grower managing a 2000-head flock that is lice-free can avoid chemical costs of at least \$1000 a year. In the future, pesticide residues from lice treatments may result in a further cost penalty due to buyer discrimination.

Integrated Pest Management (IPM)

Integrated Pest Management has been promoted as a means to combat many agricultural problems, particularly those that rely heavily on the use of chemicals. Control programs that rely on the continued use of chemicals are not sustainable because of the inevitable development of resistance to these chemicals, consequences of residues, potential health risks and environmental impact.

The two main IPM elements used to deal with lice are management options and selective use of chemicals. Before implementing an IPM approach, it is vital to understand the biology of lice, including spread and detection (see DAFWA Note: 273 Sheep lice – spread and detection).

Selective chemical use

Chemical groups

Most registered products used to treat lice belong to the following chemical groups:

- Insect growth regulator (IGR) (Zapp, Magnum etc.) affects the developmental stages of insects by preventing formation of the new external skeleton. This group does not kill adults, so allow six weeks to kill developing stages and up to 14 weeks for adults to die or for their eggs to become non-viable.
- Spinosyn (Extinosad) causes nerve dysfunction in insects, and negligible human health risks and environmental toxicity. Rapid knockdown.

- Macrocyclic lactone (ML) (Coopers Blowfly and Lice Jetting Fluid, Paramax) affects the nervous system. Rapid knockdown.
- Magnesium fluorosilicate (MgFI) (Flockmaster II etc.) causes rapid and severe dehydration of lice. Moderate rate of knockdown.
- Organophosphate (OP) (WSD Diazinon etc.)* affects the nervous system of both insects and mammals. Rapid knockdown.
- Synthetic pyrethroid (SP) (Clout S, Vanquish etc.) affects the nervous system of insects only. Achieves fairly rapid kill of all immature and adult lice, that is, within a day of full exposure to susceptible populations. Resistance reported 16 years ago.

** In May 2007, the Australian Pesticides and Veterinary Medicines Authority (APVMA) announced a suspension of the registered claim for diazinon to be used as a short wool dip for sheep lice and long wool jetting for blowflies. Products manufactured before May 2007, which display the registered label claim, can still be used according to label directions but new product will no longer include this claim and must not be used for dipping or jetting. Most of these products will expire by mid-2009.*

Short wool chemical treatments for lice can be applied using an off-shears backliner, or shower or plunge dip within six weeks after shearing. Applying chemicals in long wool is unlikely to eradicate lice but may aid their control.

Louse resistance

During the late 1980s, resistance to synthetic pyrethroids (Clout S, Vanquish etc.) was discovered in several states including Western Australia. The incidence of resistance is widespread. On some properties the level of resistance is so severe that this chemical group, whether applied as an off-shears backline, dip or long wool treatment, does not provide effective control. Results from the National Wool Residue Monitoring Survey show that Western Australia has one of the highest SP levels on greasy wool, presumably due to long wool SP use, that is, Vanquish. The use of SPs in long wool is not recommended due to the very high risk of residues and the unpredictability of its effectiveness, which may require additional long wool treatment.

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Over the past few years, more farmers have reported treatment failure using IGR off-shears backliners. In most cases, when investigated, other possible causes of a continued louse infestation were identified including:

- introducing sheep of unknown lice status
- split treatment of ewes and lambs
- possible chemical misapplication to some sheep.

However, IGR resistance is suspected on some properties where lice have been detected within six months of treatment. Currently, there is no convenient laboratory test available to detect IGR resistance, so all other possible causes of treatment failure must be discounted before an investigation is undertaken to indicate the possible presence of resistance (see DAFWA Note: 190 Sheep lice – resistance to insect growth regulators).

Lice eradication

Reliable eradication requires pesticide treatment of all sheep at shearing or within six weeks after shearing. Backline application should be applied on the day of shearing, if possible. In addition, application at this time results in lower residues in next year's clip because less chemical is used and the chemical has a longer time to degrade until the next shearing.

Off-shears backline treatment:

- use an insect growth regulator (Zapp, Magnum, Epic, Command, etc.)*
- use a diazinon off-shears backliner (for example, Eureka Gold)

Short wool dip up to six weeks, preferably two to three weeks off-shears:

- use an insect growth regulator (Fleececare, Strike, etc.)*
- use an organophosphate (Diazinon, Jetdip, etc.)[^]
- spinosyn (Extinosad)
- magnesium fluorosilicate (Flockmaster II, Splash, etc.).

* *There is some evidence of emerging IGR resistance. Frequent and thorough monitoring for signs of rubbing should be undertaken after treatment.*

[^] *In May 2007, the use of diazinon as a dip was suspended. Only product bearing a label that includes the dip claim can be used. All new products omit this claim.*

Some growers routinely treat for lice without knowing if lice are present, but chemicals should only be used when necessary, that is, when lice are found or suspected. Eradicating lice and preventing their reintroduction can achieve considerable cost savings (See DAFWA Note: 270 Sheep lice – biosecurity can prevent introduction).

Long wool treatment

Organophosphates, such as diazinon, are not registered for use in long wool for lice control. Before any treatment, the potential residue implications should be considered carefully.

Wool length	Possible action if lice are detected
6 wks to 6 mths	Unlikely to eradicate but handjetting with a registered IGR (or Magnum could also be used as a long wool backliner), spinosyn (may have to re-treat due to short duration of action) or ivermectin, should reduce the amount of fleece damage. Note: Magnum, Zapp, Triffik, Epic etc can be used on lambs up to three months old.
6–9 mths	If a light infestation (less than 2 lice per 10 cm parting), consider no flock treatment. If a medium (2–5 lice per 10 cm parting) or heavy infestation, use a registered long wool product such as Coopers Blowfly and Lice Jetting Fluid, Paramax or Extinosad). Eradication at this time is very unlikely and monitoring should continue. Thus, it is essential that an eradication treatment be applied after shearing.
9–10.5 months	If a light infestation, consider no flock treatment. If a medium infestation, use a registered long wool treatment (Coopers Blowfly and Lice Jetting Fluid, Paramax, Extinosad, etc.). If a heavy infestation, consider premature shearing. An eradication treatment is essential after shearing.
> 10.5 months	Options are to wait until the normal shearing, use a product with a nil wool harvesting interval (e.g. Extinosad) or to premature shear.

See DAFWA Note 269 Commonly used chemicals to treat sheep lice and blowflies, for currently registered products.

Withholding Period/Export Slaughter Interval restrictions

The wool harvesting interval (WHI), previously referred to as the wool withholding period (WHP), is defined as the time from application of a chemical to when the wool is shorn (also includes crutching).

Before applying a chemical, it is essential to check the Export Slaughter Interval (ESI) to ensure that it can be complied with. The ESI is the time from chemical application to when an animal is slaughtered for export. Some producers have had sheep rejected at abattoirs due to insufficient time being allowed between treatment and slaughter. The meat WHP appears on the label but the ESI does not appear on labels of older products. All new products will include the ESI, however. Abattoirs require the (longer) ESI to be complied with, as well as the meat WHP (the meat WHP relates only to the domestic meat market and is generally shorter than the ESI). Where the ESI is not on the product label, they can be found on the current version of the National Sheep Vendor Declaration or the APVMA website (www.apvma.gov.au).

Further information:

DAFWA Note: 269 Commonly used chemicals to treat sheep lice and blowflies

DAFWA Note: 190 Sheep lice – resistance to insect growth regulators

DAFWA Note: 273 Sheep lice – spread and detection

DAFWA Note: 270 Sheep lice – biosecurity can prevent introduction