

COOPERS® MAGNUM® TECHNICAL MANUAL



Life is unpredictable
Rely on **MAGNUM®**
Lice Control that Works!



Why is Coopers® MAGNUM® now used by more Australian farmers than any other off-shears sheep lice treatment¹?

Coopers MAGNUM is a convenient, easy to apply off-shears pour-on sheep lice treatment.

MAGNUM offers Australian wool and sheepmeat producers:

- Proven, effective lice control
- Protection against re-infestation for 12 weeks after treatment
- Lice treatment option that can be used on unshorn lambs up to 3 months of age
- Nil Meat Withholding Period and Nil Export Slaughter Interval when applied off-shears
- Rainfast formulation
- Applicators that can be easily cleaned with water and detergent after use
- Favourable safety profile for the operator

MAGNUM is manufactured in Australia and marketed by Coopers Animal Health, a supplier of lice control products to Australian farmers for over 120 years.

SHEEP LICE - THE PROBLEM

Sheep lice are a major problem to the Australian sheep industry.

Therefore, to achieve effective lice control it is important that farmers choose an effective lice control chemical, apply it correctly and ensure they have adequate stock management practices in place.

The body louse or biting louse (*Bovicola ovis*) is the most prevalent and economically important species of louse found on sheep in Australia. The body louse feeds on skin debris and wool grease. The heaviest concentration of body lice is found along the sides of the sheep, from neck to flank. Body lice can also be found in the neck folds and shoulder areas.



Body louse (*Bovicola ovis*)
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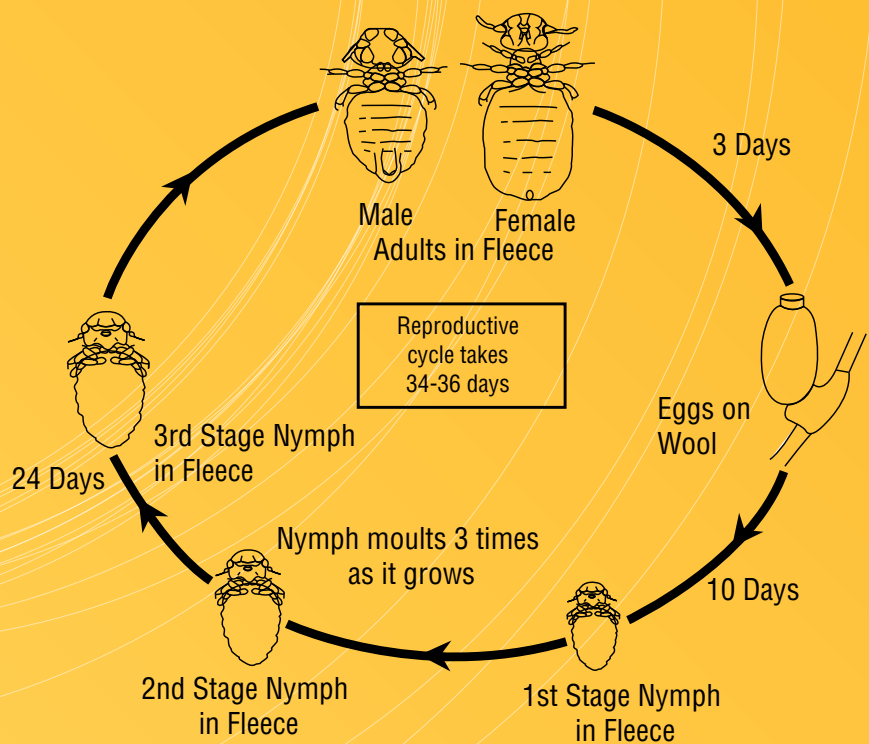
Sheep infested with the body louse will attempt to alleviate the irritation caused by their presence by scratching, rubbing, biting and pulling at their wool. This results in:

- Cotted (matted) fleeces
- Fleece discolouration (yellowing)
- Fleece derangement
- Cockle (pelt defect which downgrades the value of the hide)
- Reduced appetite and body condition

SHEEP LICE LIFECYCLE

The time for completion of the louse lifecycle from egg to egg will vary with environmental conditions. The minimum time under ideal conditions is 34-36 days. Each female louse lays eggs at a maximum rate of two eggs every three days and attaches them tightly to the wool fibre close to the skin. It is estimated that each female will lay 15-20 eggs in their lifetime.

Under ideal conditions, the eggs hatch in 10 days. From the egg emerges the first nymphal stage, which resembles the adult louse except it is smaller and colourless. These nymphs moult three times before becoming an adult louse and the process takes a total of 21-24 days. The adult female is ready to lay eggs 3-4 days later and the cycle continues.



Fleece derangement as a result of a heavy lice infestation
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Lifecycle of the body louse (*Bovicola ovis*)

COOPERS MAGNUM - LICE CONTROL THAT WORKS!

INDICATIONS

Coopers® MAGNUM® is indicated for the control and treatment of body lice (*Bovicola ovis*) on sheep off-shears and unshorn lambs up to 3 months of age, including lice resistant to synthetic pyrethroids. MAGNUM also protects against establishment of lice populations if treated sheep are exposed to re-infestation within 12 weeks of treatment.

Coopers MAGNUM aids in the control of body lice infestations when used on long woolled sheep (6 weeks to 6 months wool).

ACTIVE INGREDIENT

25 g/L Diflubenzuron

MODE OF ACTION

Diflubenzuron belongs to a class of compounds called Benzoyl Phenyl Urea's (BPU's) which are Insect Growth Regulators (IGRs). IGRs do not kill the parasite directly but interfere with growth and development. BPU's are chitin synthesis inhibitors, and act on immature parasite stages.

MAGNUM prevents the development of juvenile lice present at application and of nymphs which hatch from eggs in the weeks following treatment by preventing the deposition of chitin (essential component of the outer cuticle), thereby causing death. MAGNUM only affects juvenile stages of lice and adult lice will die out naturally following treatment. Whilst lice numbers decline rapidly in the weeks following treatment, it could take up to 20-25 weeks after treatment for sheep to be lice free.

TREATMENT FOR LICE

OFF-SHEARS LICE CONTROL

For effective off-shears lice control, MAGNUM must only be used within 24 hours of shearing. It is essential to treat all sheep in the flock. Research has demonstrated that in the first 24 hours after shearing there is a dramatic increase in grease production (lanolin flow) and this will help ensure MAGNUM is distributed around the sheep's body.

It is essential that all sheep are cleanly shorn. MAGNUM is not recommended to be applied to sheep shorn with cover combs.

It is recommended to weigh the heaviest animals in each group (ewes, rams, lambs) and dose the mob according to this heaviest liveweight. Prior to commencing treatment, it is recommended that the applicator be calibrated to ensure the correct dose is applied.

The applicator can be calibrated as follows:

- Set the applicator to the recommended dose rate after determining the heaviest liveweight in the mob.
- Squirt 10 doses into a 300 mL measuring cylinder (Note: If using the Manual 30 mL Defender Applicator, simply unscrew the T bar nozzle to assist squirting the dose into the measuring cylinder. If using the Genesis 30 mL Power Doser™ replace the T bar nozzle with the fan spray nozzle to assist calibration. Once calibrated ensure the T bar nozzle is refitted prior to commencing treatment).
- Check that the total volume delivered is equal to 10 times the recommended dose rate.
- If the total volume delivered is correct, then you are now ready to commence treatment. If the dose delivered is too great or too little, adjust the dose rate and recalibrate as above.



Dose Table – Off-shears

ANIMAL	PEST	LIVEWEIGHT (Kg)	DOSE (mL)	SHEEP TREATED/20 L
Sheep (Off-shears)	Body Lice (<i>Bovicola ovis</i>)	<10	8	2500
		11-20	10	2000
		21-30	15	1333
		31-55	20	1000
		56-75*	25	800

* Add 5 mL for each 10 kg above 75 kg

Application – Off-shears

MAGNUM is recommended to be applied from poll to tail along the backline in a single band using the recommended applicator fitted with a **T bar nozzle**. Alternatively, split the recommended dose in half and apply one half dose in a band from the poll to the middle of the back and the second half dose in a band from the middle of the back to the tail ensuring that the two bands meet. **Do not** deviate from the spine.



CORRECT

INCORRECT

Recommended Applicators

MAGNUM is recommended to be applied with the following applicators:

- 30 mL Instrument Supplies Defender™ applicator fitted with a T bar nozzle



- 30 mL Genesis Power Doser™ fitted with a T bar nozzle



If the operating pressure is too low, then it is unlikely the full dose will be expelled. If the operating pressure is too high, then the dose will be expelled quicker, making it difficult to achieve consistent application from poll to tail. Increasing the operating pressure does not reduce refill time. The time required for the barrel to refill is determined by the tension on the spring located at the back of the applicator.

As MAGNUM is a viscous formulation, it is important that the Power Doser be set up for MAGNUM. This requires that 10 mm internal diameter CVT (Clear Vinyl Tubing) draw off tubing be used and that the Power Doser is fitted with a spacer at the back of the applicator to increase the tension on the return spring. To assist drawing MAGNUM from a 20 L drum, it is recommended to elevate the drum (i.e. place the 20 L drum on top of a 200 L (44 gallon) drum).

The Genesis Power Doser can be operated with either compressed air or LP Gas. The recommended operating pressure for applying MAGNUM is 45-50 psi (310-345 kPa). A 9 kg gas bottle will deliver approximately 12,000 x 20 mL doses.



LONG WOOL LICE CONTROL

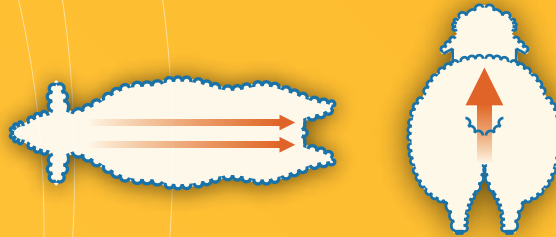
Coopers MAGNUM aids in the control of body lice infestations when used on long woolled sheep (6 weeks to 6 months wool). Trials demonstrated that MAGNUM suppressed long wool lice populations for approximately 20 weeks.² It is recommended that sheep be treated with either an off-shears backliner (e.g. Coopers MAGNUM; Eureka Gold™; Clout-S®) or a short wool saturation dip product (e.g. Di-Jet® Strike®) at the following shearing.

Dose Table – Long Wool

ANIMAL	PEST	DOSE RATE	SHEEP TREATED/ 20 L
Sheep (Long wool)	Body Lice (<i>Bovicola ovis</i>)	51 mL (3 x 17 mL bands)	392

Application – Long wool

MAGNUM is recommended to be applied as two parallel bands along the backline and a single band up and over the crutch area. Use the recommended applicator as outlined above and ensure it is fitted with a **fan spray nozzle**. Hold the applicator approximately 25 cm above the sheep to ensure the spray bands are 15 cm wide.



PACKAGING

MAGNUM is available in:

- 5 L Backpack
- 20 L Drum
- 20 L Magnum Value Pack



COOPERS MAGNUM - LICE CONTROL THAT WORKS! *(CONTINUED)*

FIELD EFFICACY

To confirm the field efficacy of MAGNUM, it has been tested on a range of sheep types, climatic regions and husbandry situations. At each site reported below, 25 tracer sheep were identified and assessed for lice at forty fleece partings

prior to treatment and 6, 12 and 20 weeks after treatment. Greater than 99.6% reductions over pre-treatment counts were seen within 6-7 weeks of treatment.³

	NUMBER OF SHEEP	WOOL TYPE	FIBRE DIAMETER (µM)	REDUCTION IN LICE NUMBERS (%)		
				6 WAT	12 WAT	20 WAT*
Uralla, NSW	1,309	Fine	19	99.9 [#]	100	100
Crookwell, NSW	680	Fine	20	99.6	100	100
Guyra, NSW	2,000	Superfine	17	100	100	100
Coonalpyn, SA	1,101	Strong	23	99.6	100	100
Lucindale, SA	1,094	Very Strong	26	99.7	100	100
Lismore, Vic	812	Fine	20	99.6 [#]	100	100 ^a

WAT : Weeks after treatment.

* Data from 50 sheep, as during the final inspection at each site when and if no lice were found on the 25 tracers a further 25 sheep selected on sign of wool derangement were examined.

[#] Inspection conducted 7 WAT

^a Inspection conducted 23 WAT



USE IN LAMBING EWE FLOCKS AND UNSHORN LAMBS

MAGNUM can be used to treat unshorn lambs from birth up to 3 months of age.

Coopers MAGNUM may be used for lice control in the following situations:

Ewes with lambs at foot (up to 3 months old): Shear and treat the ewes. Treat the unshorn lamb at the off-shears lice rate.

Ewes with lambs at foot (> 3 months old): Shear and treat the ewes. Shear and treat the lambs at the same time.

Pregnant ewes which have not yet started lambing: Shear and treat the ewes. The lambs born to treated ewes should then be treated at a convenient time (e.g. lamb marking) within 9 weeks of treating the ewes.

WATER BASED FORMULATION

Coopers MAGNUM is water based and does not contain any solvents. This means MAGNUM is virtually odourless and non-flammable.

Equipment used to apply MAGNUM cleans easily in water and detergent after use.

RAINFAST

Coopers MAGNUM is rainfast. The efficacy of MAGNUM is not affected by moderate rainfall either before or after treatment.

During the development of MAGNUM, lousy sheep were exposed to 25 mm of artificial rain during the hour prior to treatment and 25 mm of artificial rain during the hour after treatment (to simulate storm type rain). Lice counts were conducted out to 20 weeks after

treatment and lice numbers were reduced by 100% to non-detectable levels.

QUARANTINE PERIOD

It is recommended that sheep treated with MAGNUM should not be mixed with untreated sheep until at least 3 weeks after treatment. However, wherever practical, avoid mixing treated sheep with untreated sheep at all times.

PROTECTION AGAINST RE-INFESTATION

Following treatment with MAGNUM off-shears, sheep will be protected from the establishment of lice populations for a period of 12 weeks after treatment if untreated lousy sheep are accidentally mixed with the mob.

MARKER DYE

MAGNUM contains two coloured dyes that combined give it a purple appearance. The dye is added to help identify treated sheep. When animals are returned to a paddock environment following treatment, the dye degrades quickly upon exposure to sunlight and rainfall and should not be visible within 60 days of treatment. Trials conducted during the development of MAGNUM demonstrated that the dye is fully scourable. MAGNUM is not recommended to be used on housed (shedded) sheep that will not be exposed to sunlight for the first two months following treatment. The dye used in Coopers MAGNUM to identify treated sheep requires exposure to natural sunlight to degrade following treatment.

OCCUPATIONAL HEALTH & SAFETY

When applying MAGNUM it is recommended to wear rubber gloves. The water based formulation means MAGNUM is virtually odourless and non-flammable.

SAFETY IN TARGET ANIMALS

MAGNUM offers a wide margin of safety on treated stock with sheep treated at up to 5 times the recommended label rate in trials showing no signs of toxicity or skin reactions following treatment. Furthermore, during the development of MAGNUM, 7,220 sheep (primarily Merinos) in 14 pen and field studies, were treated with MAGNUM and no adverse reactions to the treatment were recorded.³

Sheep should not be treated off-shears in extremely hot weather (>40 °C) or if under heat stress.

FIRST AID

If poisoning occurs, contact a doctor or Poisons Information Centre (Phone 131 126). Additional information is listed on the Material Safety Data Sheet which can be found at www.coopersanimalhealth.com.au

STORAGE

MAGNUM should be stored below 30°C (Room temperature) in the closed, original container in a well ventilated area. Do not store for prolonged periods in direct sunlight.

DISPOSAL

This container can be recycled if it is clean, dry, free of visible residues and has the **drumMUSTER** logo visible. Triple or pressure rinse container for disposal. Dispose of rinsate or any undiluted chemical according to State legislative requirements. Wash outside of the container and the cap. Store cleaned container in a sheltered place with cap removed. It will then be acceptable for recycling at any **drumMUSTER** collection or similar container management program site. The cap should not be replaced but may be taken separately.

WITHHOLDING PERIODS

OFF-SHEARS – MEAT		COMMENT
Meat Withholding Period	Nil	This allows the farmer to capitalise on domestic or export market opportunities when they arise.
Export Slaughter Interval	Nil	
LONG WOOL (6 WEEKS TO 6 MONTHS WOOL) – MEAT		
Meat Withholding Period	42 days	
Export Slaughter Interval	42 days	
MILK	Do not use on lactating or pregnant ewes where milk or milk products may be used for human consumption.	
WOOL	Do not use less than 6 months before shearing or fibre collection.	

COOPERS LICE CONTROL PRODUCT RANGE

Coopers Animal Health have an extensive range of sheep lice control products including off-shears backliners, short wool saturation dips and long wool treatments.

The following table outlines the Coopers Lice Control Product range. For further information on these products, and advice on lice control in your flock, please contact your local reseller, Coopers Representative or Coopers Customer Service Toll Free on 1800 226 511.

	INSECT GROWTH REGULATOR	ORGANOPHOSPHATE	SYNTHETIC PYRETHROID	MACROCYCLIC LACTONE
Off- Shears Backliner	MAGNUM®	Eureka Gold™	Clout-S®	
Short Wool Saturation Dip	Strike®	Di-Jet®		
Long Wool Hand-Jetting	Strike			Paramax® Multi-Purpose Concentrate, Blowfly & Lice (Jetting Liquid)
Long Wool Spray-On Backliner	MAGNUM		Vanquish®	



COOPERS MAGNUM'S KEY FEATURES

CLAIM	MAGNUM
OFF-SHEARS	
Control and treatment of lice infestations	Yes
Withholding period-meat	NIL [#]
Export Slaughter Interval	NIL [#]
Active Ingredient	Diflubenzuron
Formulation base	Water
Applicator cleaning instructions	Rinse with water and detergent
Quarantine period*	3 weeks
Re-infestation protection period	12 weeks
Rainfast	Yes
LONG WOOL APPLICATION	
Long wool lice suppression [^]	Yes

When applied off-shears as per label instructions

[^] When applied at long wool rate as per label instructions

* Minimum time that should elapse before treated sheep are mixed with untreated sheep

10 TIPS FOR SUCCESSFUL OFF-SHEARS LICE CONTROL USING MAGNUM

1. Shear and treat all sheep at the one time. Avoid split-shearing.
2. Ensure sheep are cleanly shorn. Avoid the use of cover combs.
3. Always read the label and treat in accordance with label recommendations.
4. Treat sheep within 24 hours of shearing.
5. Ensure applicator is calibrated to the recommended dose before use and is fitted with a T bar nozzle.
6. Apply product from poll to tail down the middle of the backline, do not deviate from the spine.
7. Ensure lambs are treated:
 - Lambs <3 months old – treat as unshorn lambs when shearing and treating ewes
 - Lambs >3 months old – shear and treat lambs when shearing and treating ewes
 - Lambs born after shearing ewes – treat as unshorn lambs within 9 weeks of shearing and treating ewes
8. Do not mix treated sheep with untreated sheep.
9. Maintain stock-proof boundary and internal fencing.
10. Prevent re-infestation of lice by quarantining introduced sheep until it is certain they are lice free.

Coopers Animal Health

(A division of Schering-Plough Pty Ltd)

For further information on MAGNUM or any other Coopers products, please contact your local Coopers Animal Health representative or contact Coopers Animal Health Customer Service on Toll Free 1800 226 511, Monday to Friday, 8.30am-5.00pm.

Please, visit our website at: www.coopersanimalhealth.com.au

1 Animal Health Alliance Data, MAT Q1 2006, Baron Consulting

2 SPAH Data on file. Report Number 01/0163

3 Sherwood, N.S. and Clayton, E.H. (2001). *Development of an insect development inhibitor for the control of Bovicola ovis in sheep*, FLICS Conf. Proc., 161-169.

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™ Power Doser is a trademark of Genesis Industries Pty Ltd

™ Defender Instrument Supplies

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