

# Registered drenches for sheep worms

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## Introduction

Drenches or anthelmintics continue to play a major role in worm control in sheep. However, resistance to drenches is widespread and getting worse. Drenches should be used well and in combination with other worm control strategies.

Following is an overview of the different drench types available and a list of drenches currently registered for use in sheep in New South Wales as at April 2006. Not all registered drenches will be available. Check with your supplier.

Note that most drenches are not registered for use in goats. Such drenches can only be used in goats if you have written directions from a veterinarian.

## Searching this document

To search within this document (for drench names for example), use the search function in Adobe Acrobat® Reader.

## Broad-spectrum drenches

Broad-spectrum drenches kill all types of **susceptible** round worms of sheep. If resistance is present, not all worms will be killed.

## Benzimidazole drenches

These are also known as 'BZ' or 'white' drenches. Examples: Valbazen®, Systamex®, Panacur® (see [Table 1](#)). Sheep worms on around 90% of farms have resistance to BZ drenches.

## Levamisole/morantel drenches

Also known as 'LEV' or 'clear' drenches.  
Examples: Nilverm®, Ripercol® (see [Table 1](#)).

Sheep worms on around 80% of farms have resistance to LEV drenches. Resistance of the scour worms (*Ostertagia* and *Trichostrongylus* species) to LEV drenches is common; however, LEV is still effective against barber's pole worm (*Haemonchus*) on most properties. In recent years, in northern NSW at least, resistance of *Haemonchus* to LEV drenches has started to become more common.

## Macrocyclic lactone drenches

Also known as 'ML' drenches, and sometimes 'mectins' or 'avermectins/milbemycins'.  
Examples: Ivomec® and Virbamec Oral® (both 'avermectins'); Cydectin® (a 'milbemycin')—see [Table 1](#).

MLs are the newest group of broad-spectrum drenches. ML resistance is now becoming more common, and occurs in all major sheep-raising areas, especially in Western Australia (small brown stomach worm) and northern New South Wales and Queensland (barber's pole worm). Resistance of small brown stomach worm to MLs is now becoming more common in the non-seasonal and winter rainfall areas of southern NSW, Victoria and South Australia.

As with all drenches, resistance to this group is likely to increase more rapidly if they are used inappropriately.

## Combination drenches

Combination drenches combine one or more drench types and are generally broad-spectrum in activity.

- **Levamisole plus Benzimidazole (LEV + BZ).**  
Examples: Scanda®, Nucombo®. Around 60% of properties have resistance to LEV + BZ combination drenches. When resistance is present, this combination is usually more effective than using either of the two drenches on its own.



- **Naphthalophos (Rametin®, Combat®, Pole-Vault®) + BZ, or + LEV, or + 'BZ + LEV', or + an ML.** You can mix naphthalophos with some ML products but, as always, check product labels. These on-farm mixtures are often effective against most roundworms in sheep but their efficacy can vary.
- **MLs combined with other broad-spectrum drenches** ('multi-active' combinations). A number of these are now registered (see [Table 1](#)). Using unrelated drenches in combination, when resistance to each active is still rare, is likely to significantly delay the development of resistance compared to using these drenches on their own. For more information, see [Agnote DAI-297 Combinations of sheep drenches, resistance and 'refugia'](#).
- **Praziquantel and broad-spectrum combinations.** Examples: First Mectindrench® and other Virbac products, Genesis Tape®, Cydectin + Tape® (see [Table 1](#)). Praziquantel is very effective against tapeworms; however, these parasites, although highly visible, are of minimal importance compared with less visible parasites such as scour worms (black scour and small brown stomach worms) and barber's pole worm.
- **Closantel and BZ.** Examples: Closal®, Rotazole®. This combination of closantel with a BZ is effective against BZ-susceptible roundworms as well as having sustained activity against susceptible barber's pole worm. Because resistance of roundworms to both components of this combination is common, the efficacy of these products needs to be tested before use. Closantel is also a flukicide.
- **Closantel and ML.** Currently one product on the market, Genesis Xtra® (abamectin + closantel). This combination of closantel with an ML is effective against ML-susceptible roundworms, as well as having sustained activity against susceptible barber's pole worm. Closantel is also a flukicide. (Q-Drench® is closantel + ML + BZ + LEV.)
- **Triclabendazole in combination with broad-spectrum drenches.** A number of these combinations are now on the market. Triclabendazole is a highly effective flukicide, with activity against day-old fluke and older.

### Capsules

Ivermectin, albendazole and ivermectin/albendazole are available in controlled-release devices or capsules. Examples: Ivomec Maximizer®, Captec Extender®, Optamax™.

BZ capsules (Captec Extender®) can still be an option on farms where there is BZ resistance, if

an appropriate 'primer' (an effective 'cleanout' drench at the time of capsule administration) is used. Check with your adviser. Ivermectin capsules should not be used where ML resistance is present. For all types of capsules, do a WormTest part-way through as well as immediately after the 100 day payout period of the capsule.

The same general principle applies to all long-acting anthelmintic products: do a WormTest approximately midway through the claimed protection period.

### Narrow-spectrum drenches

These are drenches that kill only one or a small number of worm types affecting sheep.

- **Closantel.** Examples: Seponver®, Razar®, Closicare®. This is effective against susceptible barber's pole worm with persistent activity against re-infection for 4 weeks, and with useful activity against late immature and adult liver fluke. Resistance of barber's pole worm to this drench is now common in the New England area of NSW and south-east Queensland. Several strains of liver fluke resistant to this drug have also been discovered.
- **Naphthalophos.** Examples: Rametin®, Combat®, Pole-Vault®. This is effective against barber's pole worm and has varying but often useful activity against black scour worm and small brown stomach worm. It generally is recommended in combination with a BZ or LEV, or a BZ + LEV drench, or an ML (check product labels).
- **Triclabendazole.** Examples: Fasinex®, Flukare®. For liver fluke. Triclabendazole is also available in combination with broad-spectrum drenches. Several strains of fluke with triclabendazole resistance have been discovered.
- **Nitroxynil.** Example: Trodax®. An injectable 'drench' for liver fluke and barber's pole worm.

### Choosing and using a drench—general principles

- **Do a resistance test.** Resistance to drenches is widespread. If you have not done a resistance test in the last 2–3 years, your choice of drench will be based as much on guesswork as anything. At the very least, **do regular 'DrenchChecks'**, that is, monitor faecal worm egg counts (WormTest) 7–14 days after drenching (in the case of short-acting products) to make sure the drench is effective.
- **The 'no drench' option.** Don't guess—WormTest! Every time a drench is used, there is selection for resistance to that drench,

particularly in droughts or prolonged dry spells. Avoid drenching unnecessarily. Sometimes shifting sheep to a 'low worm risk' paddock which also has better quality feed can be as effective as a drench. (See [Agnote DAI-308 WormTest for livestock and guide to egg counts.](#))

- **Narrow-spectrum vs broad-spectrum.** Ideally a narrow-spectrum rather than a broad-spectrum drench should be used in all situations where the former will suffice.
- **Short-acting vs long-acting.** It is generally thought that the more persistent an anthelmintic, the greater the selection for drench resistance. However, other factors also have a bearing on selection for resistance, including 'potency' of the drench. Opinions on the relative importance of these factors vary.

Notwithstanding this, the longer acting drenches may have advantages in certain situations, for example when conditions are very favourable for barber's pole worm. Seek professional advice on the best drench and other worm control options for your situation.

- **Drench at the right time.** Follow the worm control guidelines for your area, do regular monitoring of faecal worm egg counts (WormTest), and get professional advice.
- **Follow the label.** Use the right dose rate. Check drench guns for accuracy. Drench to the heaviest in the mob.
- **Reduce feed before drenching (for some drench types).** For white (BZ), macrocyclic lactone (ML) and closantel drenches (but **not** clear (LEV) or organophosphate (OP) drenches), reducing feed but not water 24 hours before and several hours after treatment may make the drench more effective. Do not restrict feed or water in heavily pregnant, stressed or poor sheep.<sup>1</sup> Do not restrict feed or water before or after using OP or LEV drenches.<sup>1</sup>
- **Place the tip of the drench gun over the animal's tongue.** This ensures that more of the drench will go into the first stomach (rumen or paunch), thus extending drench availability. Drench that goes into the fourth stomach (abomasum) is less effective. This is more likely to happen when drench is deposited in the front of the mouth. Take care not to direct drench into the windpipe and lungs.<sup>1</sup>
- **Combine with 'non-drench' strategies.** Use 'integrated worm control', combining timely drenching with other control strategies. These include:
  - grazing management—creating 'low worm risk' pastures for susceptible sheep such

as weaners and late pregnant or lactating ewes;

- nutrition—well-grown weaners develop immunity earlier;
- buying rams bred for increased resistance to worms;
- good flock management—compact joining and lambing, combined with weaning at 12–14 weeks after lambing.

## Further information

NSW Department of Primary Industries (NSW DPI) has a number of publications relating to worm control in sheep and cattle. Check with your local NSW DPI office or Rural Lands Protection Board (RLPB) office, or go to these sites on the internet:

- [www.agric.nsw.gov.au/reader/sheep-internal](http://www.agric.nsw.gov.au/reader/sheep-internal)
- [www.agric.nsw.gov.au/reader/cattlehealth](http://www.agric.nsw.gov.au/reader/cattlehealth)

Also see 'WormBoss':

- [www.wormboss.com.au](http://www.wormboss.com.au)

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**Always read the label:** Users of agricultural (or veterinary) chemical products must always read the label and any Permit before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or not made in this publication.

**Disclaimer:** The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product does not imply endorsement by NSW Department of Primary Industries over any other equivalent product from another manufacturer.

**Disclaimer:** The information contained in this publication is based on knowledge and understanding at the time of writing (April 2006). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

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<sup>1</sup> *Successful worm treatment*, Hennessy DR and Ali D, CSIRO pamphlet.

Table 1. Registered sheep drenches – NSW (Edited: Stephen Love, NSW DPI, April 2006)

Sources: InfoPest CD (QLD DPI); APVMA ([www.apvma.gov.au](http://www.apvma.gov.au))

(See 'Notes to Table 1' on page 14.)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
<b>BENZIMIDAZOLE (BZ, 'white drenches') — Broad-spectrum</b>					
Resistance to BZs occurs on approx. 90% of farms.					
<b>Albendazole drenches:</b>					
BZ-susceptible roundworm, lungworms, tapeworms; aids control of adult liver fluke.					
albendazole as oxide (37.7 g/L)	RYCOBEN	NOVARTIS		10	10
albendazole (19 g/L)	STRATEGIK	JUROX		10	10
albendazole (19 g/L)	ALBEN	VIRBAC	Yes	10	10
albendazole (19 g/L)	ALBENDAZOLE (Sheep, Lambs and Goats)	WSD	Yes	10	10
albendazole (19 g/L)	NEMADET	NUFARM	Yes	10	
albendazole (19 mg/mL)	VALBAZEN SHEEP LAMB & GOAT DRENCH	COOPERS	Yes	10	
albendazole (25 g/L)	STRATEGIK 25, KABEZEN	JUROX		10	10
<b>Albendazole capsules:</b>					
BZ-susceptible worms; suppresses establishment of worm larvae up to 100 days.					
albendazole (2.1 g/capsule)	EXTENDER JUNIOR (20–40 kg sheep)	NUFARM			
albendazole (3.85 g/capsule)	EXTENDER 100 ADULT	NUFARM			
albendazole (4.62 g/capsule) + 24 mg selenium (as sodium selenate) + 118 mg cobalt (as cobalt sulfate heptahydrate)	EXTENDER SeCo (40–80 kg sheep)			0	60T
<b>Fenbendazole, mebendazole and oxfendazole drenches:</b>					
BZ-susceptible roundworms, lungworms, tapeworms.					
fenbendazole (25 g/L)	FENBENDAZOLE	4 FARMERS	Yes	14	14
fenbendazole (25 g/L)	PANACUR 25	INTERVET	Yes	14	14
fenbendazole (25 g/L)	FENCARE 25	VIRBAC			
fenbendazole (25 g/L)	FENBENDAZOLE (Sheep, Goats and Cattle)	WSD	Yes	14	14
fenbendazole (25 g/L) + iodine (1 g/L) + selenium as sodium selenate (0.5 g/L)	MINERALISED FENCARE (Not registered in NSW)	VIRBAC		14	14
fenbendazole (50 g/L)	WHITE LV ORAL	BAYER			

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
fenbendazole (50 g/L)	FENBENDAZOLE (Sheep and Lambs)	WSD		14	14
mebendazole (50 g/L)	BENZICARE	VIRBAC			
mebendazole (50 g/L)	MEBENDAZOLE	WSD			
oxfendazole (22.65 g/L)	OXAZOLE LV (Sheep, Cattle and Goats)	JUROX	Yes	10 (Sheep, Goats)	14
oxfendazole (22.65 g/L)	PARAFEND	NORBROOK	Yes	10	14
oxfendazole (22.6 g/L)	OXFEN	VIRBAC	Yes	10	14
oxfendazole (45.3 g/L)	OXFEN LV	VIRBAC	Yes	10	14
oxfendazole (45.3 g/L)	COMBAT WHITE (Sheep, Cattle and Goats)	VIRBAC	Yes	10	

### LEVAMISOLE (LEV, 'clear drenches') — broad-spectrum

Resistance occurs on approx. 80% of farms (scour worms), but barber's pole worm is still susceptible on many farms.

#### LEV drenches:

LEV-susceptible roundworms, lungworms

levamisole as HCl (27 g/L)	LEVAMISOLE	4 FARMERS		3	
levamisole as HCl (27 g/L)	NILVERM ORAL DRENCH	COOPERS		3	7
levamisole as HCl (27 g/L)	NULEV	CAPTEC		3	7
levamisole as HCl (27 g/L)	RYCOZOLE	NOVARTIS		3	7
levamisole as HCl (27 g/L)	BIG L WORM DRENCH	SYKES			
levamisole as HCl (27 g/L)	LEVAMISOLE	WSD			
levamisole as HCl (340 g/L)	LEVAMISOLE GOLD MIXADRU MIXADRU CONCENTRATE	VIRBAC		3	
levamisole as HCl (67.8 g/L)	RYCOZOLE RV	NOVARTIS		14	
levamisole as HCl (67.8 g/L) + selenium as sodium selenate (1 g/L)	RYCOZOLE RV PLUS SELENIUM	NOVARTIS		3	7
levamisole as HCl (67.9 g/L)	LOW VOLUME LEVAMISOLE	WSD		3	7
levamisole as HCl (68 g/L)	NILVERM LV	COOPERS		14	14
levamisole as phosphate (68 g/L) + 5-in-1 (clostridial) vaccine (injectable)	NILVAX COMBINATION 5-IN-1	COOPERS		14	14

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
levamisole as HCl (848 g/kg)	RIPERCOL SOLUBLE POWDER	COOPERS			
levamisole as phosphate (60 g/L)	NILVERM INJECTION	COOPERS		3	7
levamisole as HCl (32 g/L)	LEVAMISOLE (32 g/L)	NUFARM			
levamisole as HCl (32 g/L)	LEVAMISOLE GOLD	VIRBAC			
levamisole as HCl (75 g/L)	COMBAT CLEAR	VIRBAC		3	
levamisole as HCl (64 g/L) + oxyclozanide (150 g/L)	NILZAN LV	COOPERS		14	
levamisole as HCl (37.5 g/L) + praziquantel (18.8 g/L)	FIRST DRENCH	VIRBAC		3	7
levamisole as HCl (75 g/L)	LEVAMISOLE GOLD LV	VIRBAC		3	7
levamisole as HCl (80 g/L)	CLEAR LV ORAL	BAYER		3	
levamisole as HCl (80 g/L)	LEVAMISOLE 80	NUFARM		3	7
levamisole as HCl (80 g/L)	NULEV LV	MERIAL			
levamisole as HCl (80 mg/mL) + iodine (2.54 mg/mL) + selenium (1.25 mg/mL)	MINERALISED LEVAMISOLE (Not registered in NSW)	VIRBAC			
morantel citrate (30 mg/mL)	GOAT & SHEEP WORMER	ORALJECT	Yes	7	

### MACROCYCLIC LACTONES (ivermectins/milbemycins, 'MLs') — broad-spectrum

Resistance is becoming more common, e.g. approx. 60% of farms in WA (small brown stomach worm) and 50+% of farms in Northern Tablelands of NSW (barber's pole worm).

#### Avermectins:

ML-susceptible roundworms, lungworms, nasal bot, itch mite.

abamectin (0.8 g/L)	ABAMECTIN DRENCH – SHEEP/LAMBS	4 FARMERS			
abamectin (0.8 g/L)	ABAMECTIN BAYMEC	BAYER			
abamectin (0.8 g/L)	ZOOMEK	FARMOZ		14	28
abamectin (0.8 g/L)	ABAMECTIN ORAL	GROW FORCE			
abamectin (0.8 g/L)	OVIMECTIN	NORBROOK		14	
abamectin (0.8 g/L)	RYCOMECTIN ORAL DRENCH	NOVARTIS			

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
abamectin (0.8 g/L)	VIRBAMEC (ORAL)	VIRBAC		10	
abamectin (0.8 g/L)	ABAMECTIN ORAL DRENCH	WSD			
abamectin (0.8 g/L) + praziquantel (15 g/L)	FIRST MECTINDRENCH	VIRBAC			
abamectin (0.8 g/L) + praziquantel (15 g/L)	VIRBAMEC GOLD	VIRBAC			
abamectin (0.8 g/L) + praziquantel (15 g/L) + selenium as sodium selenate (0.4 g/L)	FIRST MECTINDRENCH PLUS SELENIUM	VIRBAC			
abamectin (0.8 g/L) + praziquantel (15 g/L) + selenium (0.4 g/L)	FIRSTMECTIN SE	VIRBAC			
abamectin (0.8 g/L) + praziquantel (15 g/L) + selenium (0.4 g/L)	VIRBAMEC GOLD WITH SELENIUM	VIRBAC			
abamectin (0.8 g/L) + selenium as sodium selenate (0.4 g/L)	ZOOPEC PLUS SELENIUM	FARMOZ		14	
abamectin (0.8 g/L) + selenium as sodium selenate (0.4 g/L)	OVIMECTINSE	NORBROOK		14	
abamectin (0.8 g/L) + selenium as sodium selenate (0.4 g/L)	VIRBAMEC ORAL PLUS SELENIUM	VIRBAC			
abamectin (0.8 mg/mL)	PARAMECTIN ORAL SOLUTION – SHEEP	JUROX		14	28
abamectin (0.8 mg/mL) + cobalt, copper, iodine, selenium and zinc	PARAMECTIN (Mineralised, for Sheep)	JUROX		14	
abamectin (10 mg/mL)	GENESIS INJECTION – ABAMECTIN	ANCARE		35 (Sheep)	42
abamectin (10 mg/mL) + vitamin B12	GENESIS INJECTION – ABAMECTIN (plus vitamin B12) (Sheep and Cattle)	ANCARE		35 (Sheep)	
abamectin (1 g/L)	GENESIS OILY	ANCARE			
abamectin (1 g/L)	PARAMECTIN ORAL DRENCH – SHEEP	JUROX			
abamectin (1 g/L) + praziquantel (18.8 g/L)	GENESIS TAPE	ANCARE		14	28
abamectin (2 g/L)	ABAMEC BAYMEC LV (Sheep and Lambs)	BAYER		14	
abamectin (2 g/L)	ABAMAX LV LOW VOLUME	PHARMTECH		14	
abamectin (2 g/L)	VIRBAMEC LV	VIRBAC			
abamectin (2 g/L)	COMBAT ABAMEC	VIRBAC			

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
abamectin (2 g/L)	ABAMECTIN, Low Volume	WSD		14	
abamectin (2 g/L) + selenium as sodium selenate (1 g/L)	RYCOMECTIN-RV PLUS SELENIUM	NOVARTIS		14	
abamectin (2 g/L) + selenium	VETMEC LV PLUS SELENIUM	CHEMVET			
doramectin (0.750g/L)	DECTOMAX ORAL DRENCH FOR SHEEP	PFIZER		14	
ivermectin (0.8 g/L)	ECOMECTIN LIQUID FOR SHEEP	ECO ANIMAL HEALTH			
ivermectin (0.8 g/L)	IVOMEC LIQUID – SHEEP	MERIAL		10	10
ivermectin (0.8 g/L)	NOROMECTIN LIQUID	NORBROOK		10	
ivermectin (0.8 g/L) + selenium	NOROMECTIN PLUS SELENIUM	NORBROOK		10	
ivermectin (0.8 g/L)	NUMECTIN	NUFARM			
ivermectin (0.8 g/L)	SHEEPMEC	VIRBAC			
ivermectin (0.8 g/L)	VIRBAMAX DRENCH	VIRBAC		10	10
ivermectin (0.8 g/L) + selenium as sodium selenate (0.4 g/L)	IVOMEC LIQUID WITH SELENIUM – SHEEP	MERIAL		10	
ivermectin (0.8 g/L) + selenium as sodium selenate (0.5 g/L)	VIRBAMAX PLUS SELENIUM DRENCH	VIRBAC			
ivermectin (16 g/L)	PARAMAX (CONCENTRATE)	COOPERS		14*	21*
				*when used as a drench	
ivermectin (1 g/L)	GENESIS DRENCH	ANCARE		14	14
ivermectin (1 g/L) + selenium as sodium selenate (0.5 g/L)	GENESIS DRENCH WITH SELENIUM	ANCARE		14	
ivermectin (2 g/L)	IVOMEC-RV – SHEEP	MERIAL		10	10
ivermectin (2 g/L)	DOVAMECTIN RV	JUROX		21	
ivermectin (10 g/L)	IMAX SC ORAL CONC.	PHARMTECH		14	14

Ivermectin capsules: See '[Capsules](#)'

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
<b>Milbemycins:</b>					
ML-susceptible roundworms, lungworms, itch mite.					
moxidectin (1 g/L)	CYDECTIN ORAL DRENCH FOR SHEEP	FORT DODGE		7	7
moxidectin (1 mg/mL) + praziquantel (18.8 g/mL)	CYDECTIN PLUS TAPE	FORT DODGE		7	7
moxidectin (1 mg/mL) + selenium as sodium selenate (0.5 mg/mL)	CYDECTIN Se	FORT DODGE			
moxidectin (1 mg/mL) + triclabendazole (50 mg/mL)	CYDECTIN PLUS FLUKE	FORT DODGE			
moxidectin (2.5 g/L) + <i>Corynebacterium pseudotuberculosis</i> + others	CYDECTIN WEANERGUARD	FORT DODGE		28	28
moxidectin (2.5 g/L) + <i>Corynebacterium pseudotuberculosis</i> , others ( <i>Clostridium</i> spp.), vitamin B12 and selenium	CYDECTIN WEANERGUARD 6-in-1 vaccine and wormer with vitamin B12 and selenium	FORT DODGE		28	
moxidectin (2 g/L)	CYDECTIN LV	FORT DODGE		7	7
moxidectin (2 g/L) + selenium as sodium selenate(1 g/L)	CYDECTIN LV Se	FORT DODGE		7	
moxidectin (5 g/L) + <i>Corynebacterium pseudotuberculosis</i> + others	CYDECTIN EWEGUARD	FORT DODGE		28	28
moxidectin (5 g/L) + <i>Corynebacterium pseudotuberculosis</i> , others ( <i>Clostridium</i> spp.), vitamin B12 and selenium	CYDECTIN EWEGUARD 6-in-1 vaccine and wormer with vitamin B12 and selenium	FORT DODGE		28	
moxidectin (10 g/L)	CYDECTIN Injection for Cattle and Sheep	FORT DODGE		28 (Sheep)	
moxidectin (20 g/L)	CYDECTIN Long Acting for Sheep	FORT DODGE		91	133
<b>COMBINATION DRENCHES (broad-spectrum)</b>					
<b>Combinations: BZ + LEV</b>					
Dose ~ 13–17c/50 kg. BZ-susceptible or LEV-susceptible roundworms; lungworms, tapeworms.					
Approximately 60% of farms have resistance to combination 'BZ + LEV' drenches.					
albendazole as oxide (34 g/L) + levamisole as HCl (70 g/L)	COMBI	NOVARTIS		10	10
albendazole as oxide (34 g/L) + levamisole as HCl (70 g/L) + other	COMBI PLUS SELENIUM	NOVARTIS		21	63

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
albendazole oxide (18 g/L) + levamisole as HCl (35 g/L)	LEVIBEN	NOVARTIS		10	
albendazole oxide (18 g/L) + levamisole as HCl (35 g/L)	ROTATE	NOVARTIS		10	10
fenbendazole (25 g/L) + levamisole as HCl (33.75 g/L)	COMBINATION	4 FARMERS			
fenbendazole (25 g/L) + levamisole as HCl (40 g/L)	COMBINATION	WSD		14	14
fenbendazole (50 g/L) + levamisole HCl (80 g/L)	LOW VOLUME COMBINATION	WSD			
fenbendazole (50 g/L) + levamisole HCl (80 g/L)	COMBO LV	BAYER			
levamisole as HCl (40 g/L) + fenbendazole (25 g/L)	NUCOMBO	NUFARM		14	
levamisole as HCl (40 g/L) + fenbendazole (25 g/L)	SALVO	INTERVET		14	14
levamisole as HCl (40 g/L) + fenbendazole (25 g/L)	DUOCARE	VIRBAC		14	14
levamisole as HCl (40 g/L) + fenbendazole (25 g/L) + praziquantel (18.8 g/L)	FIRST DUODRENCH	VIRBAC			
levamisole as HCl (40 g/L) + fenbendazole (25 g/L) + selenium as sodium selenate (0.5 g/L)	DUOCARE WITH SELENIUM	VIRBAC		14	
levamisole as HCl (67.8 g/L) + fenbendazole (50 g/L) + others	DUOCARE and COMBAT DUO LV WITH SELENIUM	VIRBAC			
levamisole as HCl (69 g/L) + oxfendazole (45.3 g/L) + zinc, cobalt, selenium	SCANDA	COOPERS		10	14
levamisole as HCl (80 g/L) + fenbendazole (50 g/L)	COMBIMAX LV COMBINATION	PHARMTECH		14	
<b>Combinations: ML + other broad-spectrum(s)</b>					
abamectin (1.0 g/L) + levamisole as HCl (40 g/L) + closantel (37.5 g/L) + albendazole (25 g/L)	Q-DRENCH	JUROX		28	
ivermectin (6.0 g/L) + levamisole as HCl (80.0 g/L) + oxfendazole (45.3 g/L) + zinc, cobalt, selenium	SCANDAMAX	COOPERS		14	
ivermectin (0.8 g/L) + levamisole as HCl (25.5 g/L) + albendazole (20 g/L)	TRITON	MERIAL		14	

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
<b>Combinations: OPs + broad-spectrum(s)</b>					
These combinations may be an effective broad-spectrum even if BZ, LEV or ML resistance is present. Check with your advisor.					
Naphthalophos (Rametin® or Combat®) + BZ or LEV or BZ/LEV or ML (on-farm mixtures; check labels)					
naphthalophos + BZ ± LEV (twin pack)	RAMETIN COMBO, RAMETIN CLEAR	BAYER			
naphthalophos (800 g/L) + abamectin (20 g/L) (mix pack)	RAMETIN ML SHEEP DRENCH MIX PACK	BAYER	[Not yet available (April 2006)]		
<b>Combinations: praziquantel (tape wormer) + broad-spectrum(s)</b>					
See broad-spectrum lists above. Look for drenches with 'praziquantel'.					
<b>CAPSULES (broad-spectrum)</b>					
<b>BZ capsules:</b>					
albendazole (2.1 g/capsule)	EXTENDER JUNIOR (20–40 kg sheep)	NUFARM		0	60T
albendazole (3.85 g/capsule)	EXTENDER 100 ADULT	NUFARM		0	60T
albendazole (4.62 g/capsule) + 24 mg selenium (as sodium selenate) + 118 mg cobalt (as cobalt sulfate heptahydrate)	EXTENDER SeCo (40–80 kg sheep)				
<b>ML capsules:</b>					
ivermectin (80 mg/capsule)	IVOMEC MAXIMIZER (Weaner sheep 20–40 kg)	MERIAL		126	126
ivermectin (160 mg/capsule)	IVOMEC MAXIMIZER (Adult sheep 40–80 kg)	MERIAL			
<b>ML/BZ capsules:</b>					
ivermectin (80 mg/capsule) + albendazole (2.76 g/capsule)	OPTAMAX 100 DAY SEQUENTIAL RELEASE CAPSULE FOR 40–80 kg SHEEP	MERIAL/CAPTEC		126	
ivermectin (40.6 mg/capsule) + albendazole (1.38 g/capsule)	OPTAMAX WEANER 100 DAY SEQUENTIAL RELEASE CAPSULE FOR 20–40 kg SHEEP	MERIAL/CAPTEC		126	
<b>ORGANOPHOSPHATES ('OPs') — mid-spectrum</b>					
One case of resistance recorded in Australia. Highly effective against barber's pole worm; moderately effective against black scour worms and small brown stomach worm.					
naphthalophos (800 g/kg)	COMBAT	VIRBAC		7	

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
naphthalophos (800 g/kg) + selenium as sodium selenate (0.5 mg/mL)	COMBAT SE SELENISED	VIRBAC		7	
naphthalophos (800 g/kg)	POLE-VAULT	ALLFIRE		7	
naphthalophos (800 g/kg)	RAMETIN SHEEP DRENCH	BAYER		7	7

### FLUKICIDES AND OTHERS

In addition to liver fluke, some are also active against barber's pole worm and other species. Also, some flukicides are combined with broad-spectrum drenches.

Drenches with albendazole only aid in the control of adult liver fluke, i.e. no effect against immature fluke.

#### Closantel + BZ combination drenches:

Susceptible barber's pole, including 28 days protection against reinfection, other BZ tapeworms, liver fluke over 4–6 weeks old (4 weeks in the case of closantel + oxfendazole), nasal bot.

albendazole (19 g/L) + closantel as sodium salt (37.5 g/L)	CLOSAL	COOPERS		28	60T
albendazole (19 g/L) + closantel as sodium salt (37.5 g/L)	CADDY	FARMOZ			
closantel (37.5 g/L) + oxfendazole (22.6 g/L)	CLOSICOMB	VIRBAC			
closantel (37.5 g/L) + oxfendazole (22.6 g/L)	ROTAFLUKE	VIRBAC			

#### Closantel + ML combination drenches:

abamectin (1 g/L) + closantel (50 g/L)	GENESIS XTRA	ANCARE		49	84
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#### Closantel + ML + BZ + LEV combination drenches:

abamectin (1.0 g/L) + levamisole as HCl (40 g/L) + closantel (37.5 g/L) + albendazole (25 g/L)	Q-DRENCH	JUROX			
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#### Closantel only:

Effective against susceptible barber's pole worm, including 28 days protection against reinfection; susceptible liver fluke over 6 weeks old; and nasal bot.

Approx. 60%–80% or more of farms in northern NSW and southern Queensland have closantel-resistant barber's pole worm. There are also several strains of liver fluke resistant to this drug.

closantel (37.5 g/L)	CLOSANTEL	4 FARMERS			
closantel (37.5 g/L)	CLOSICARE	VIRBAC		28	
closantel (37.5 g/L)	CLOSIMAX	PHARMTECH		28	
closantel (37.5 g/L)	CLOSANTEL	WSD			

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
closantel (37.5 g/L) + selenium as sodium selenate (0.5 g/L)	RAZAR PLUS	SCHERING-PLOUGH			
closantel (37.5 g/L) + selenium as sodium selenate (0.5 g/L)	SEPONVER Se	COOPERS		28	
closantel (37.5 g/L) + selenium as sodium selenate (0.5 g/L)	SUSTAIN + Se	JUROX		28	
closantel (37.5 g/L) + selenium as sodium selenate (1.2 g/L)	CLOSICARE WITH SELENIUM	VIRBAC		28	60T
<b>Levamisole + oxyclozanide:</b>					
levamisole as HCl (64 g/L) + oxyclozanide (150 g/L)	NILZAN LV	COOPERS		14	14
<b>Nitroxylnil:</b>					
nitroxylnil as eglumine (340 g/L)	TRODAX	FORT DODGE			
<b>Triclabendazole drenches:</b>					
triclabendazole (50 g/L)	FASINEX 50 ORAL (Sheep, Cattle, Goats)	NOVARTIS	Yes	21	63
triclabendazole (50 g/L)	FLUKARE S	VIRBAC	Yes	28	
triclabendazole (50 g/L)	TREMACIDE 50	JUROX	Yes	21	63
triclabendazole (50 g/L)	TRICLA 50 (Sheep, Cattle and Goats)	YOUNGS	Yes	21	
triclabendazole (50 g/L)	FLUKGUARD S (Sheep and Goats)	NORBROOK	Yes	21	
triclabendazole (50 g/L) + selenium as sodium selenate (0.5 g/L)	TRICLABENDAZOLE FLUKE DRENCH – SELENIUM	GROW FORCE	Yes		
triclabendazole (50g/L) + selenium as sodium selenate (0.5 g/L)	FLUKARE S WITH SELENIUM	VIRBAC	Yes	21	63
triclabendazole (100 g/L)	FASINEX 100 ORAL	NOVARTIS	Yes	21	63
triclabendazole (120 g/L)	FASICARE 120 (Cattle and Sheep)	NOVARTIS		21	
triclabendazole (120 g/L)	FASINEX 120 (Cattle and Sheep)	NOVARTIS		28	
triclabendazole (120 g/L)	TRICLA 120 (Cattle and Sheep)	YOUNGS		28	
triclabendazole (120 g/L)	TRICLAZOLE (Sheep and Cattle)	COOPERS		28	

(Table 1 continues)

Table 1 (continued)

Components	Short trade name	Brand	Registered for goats	WHP meat (days)	ESI (days)
triclabendazole (120 g/L)	FLUKARE C	VIRBAC			
triclabendazole (120 g/L)	TREMACIDE 120	JUROX			
triclabendazole (120 g/L) + selenium as sodium selenate (1 g/L)	FLUKARE C WITH SELENIUM	VIRBAC	Yes		
<b>Triclabendazole + broad-spectrum combination drenches:</b>					
triclabendazole (50 g/L) + abamectin (1 g/L)	FLUKAMEC	VIRBAC		21	63
triclabendazole (50 g/L) + abamectin (1 g/L) + selenium as sodium selenate (0.5 g/L)	FLUKAMEC PLUS SELENIUM	VIRBAC			
triclabendazole (50 g/L) + ivermectin (1 g/L)	PARAMAX-F	COOPERS			
triclabendazole (50 g/L) + ivermectin (1 g/L)	FASIMEC SHEEP/ TRICLAMEC SHEEP	NOVARTIS YOUNGS		21	63
triclabendazole (50 g/L) + ivermectin (1 g/L)	TRICLAMEC SHEEP	YOUNGS		21	
triclabendazole (50 mg/mL) + moxidectin (1 mg/mL)	CYDECTIN PLUS FLUKE	FORT DODGE		21	
triclabendazole (50 g/L) + oxfendazole (22.6 g/L)	FLUKAZOLE S	VIRBAC		21	63

**Notes to Table 1:**

- Read and follow product labels.
- This table provides a summary of available drenches. Exhaustive information on product claims, contraindications, and withholding periods is not provided. Consult labels for more detailed information.
- You must only use a product according to the label on it unless you have received written instructions from a veterinary surgeon to use it in another way.
- Note that most products cannot be used in lactating animals which are used, or likely to be used, to produce milk for human consumption. Always check the label.
- For export slaughter intervals (ESIs) and withholding periods (WHPs) see the Australian Pesticides and Veterinary Medicines Authority website: [www.apvma.gov.au/residues/ESI.shtml](http://www.apvma.gov.au/residues/ESI.shtml)
- An ESI followed by 'T' (e.g. '60T') indicates the ESI is under review and final ESI may be longer.
- Some products, notably naphthalophos, can be mixed with other drenches on-farm. (Check product labels.)
- Read and follow the label directions for the relevant products.
- We have aimed to list drenches which are registered and available. However, we cannot guarantee that all products listed are currently on the market.

Table 2. Activity of drench types in susceptible worm populations

Drench type	Worm types							
	Round worms					Flat worms		
	<i>Haemonchus</i> (barber's pole worm)	<i>Trichostrongylus</i> (black scour worm)	<i>Ostertagia</i> (small brown stomach worm)	<i>Nematodirus</i> (thin-necked intestinal worm)	<i>Chabertia</i> (large mouth bowel worm); <i>Oesophagostomum</i> (large bowel worm)	Lung worms	Tape worms	<i>Fasciola</i> (liver fluke)
<b>Broad-spectrum drenches (single active):</b>								
BZ <sup>1</sup>	[Highly effective]					[Useful activity]		
LEV	[Highly effective]					[Little or no activity]		
ML	[Highly effective]					[Little or no activity]		
<b>Combination drenches:</b>								
BZ + LEV	[Highly effective]					[Useful activity]		[Little or no activity]
Ivermectin + BZ + LEV	[Highly effective]					[Useful activity]		[Little or no activity]
Abamectin + BZ + LEV + closantel	[Highly effective]					[Useful activity]		[Some activity]
Abamectin + closantel	[Highly effective]					[Little or no activity]		[Some activity]
Closantel + BZ <sup>2</sup>	[Highly effective]					[Useful activity]		[Some activity]
Triclabendazole + broad-spectrum	[Highly effective]					[Little or no activity]		[Some activity]
Praziquantel + broad-spectrum	[Highly effective]					[Little or no activity]		
Naphthalophos + BZ, or + LEV, or + 'BZ + LEV', or + ML)	[Highly effective]					[Little or no activity]		
<b>Narrow-spectrum drenches:</b>								
Closantel	[Highly effective]	[Little or no activity]					[Some activity]	
Naphthalophos	[Highly effective]	[Some activity]		[Little or no activity]				
Triclabendazole	[Little or no activity]					[Highly effective]		

**Note:** The table above outlines activity against susceptible worm populations. **Drench resistance may alter the picture markedly.** This table is only a guide to spectra of activity; no information on persistency of activity is included. Some drenches may also have activity against other parasites, e.g. itch mite, nasal bot. The most important parasites of sheep in Australia are *Haemonchus*, *Trichostrongylus*, *Ostertagia* and, in some areas, *Fasciola*.

<sup>1</sup> Albendazole aids in the control of adult fluke.

<sup>2</sup> Closantel + oxfendazole has a claim for greater efficacy against liver fluke than closantel + other BZs.

**Key to activity in susceptible worm populations:**

Highly effective	Useful activity	Some activity	Little or no activity
[Highly effective]	[Useful activity]	[Some activity]	[Little or no activity]

Table 3. Drench costs – a rough guide

Drench / Drench group	Approximate cost per dose (cents/50 kg sheep)	
	Range	Average
BZs	9–13	12
LEV	4–7	6
BZ / LEV	13–18	
ML (oral, generally)	15–26	
ML – Cydectin® oral	25–26	
ML – Cydectin LAI		\$1.16
ML – Ivomec® oral	16–20	
ML combinations:		
Triton®, Q-Drench®		44–45
Closantel + albendazole		33
Closantel + abamectin	38–40	
Closantel		22
OPs (naphthalophos)	27–28	
Naphthalophos + BZ + LEV	41–47+	
Triclabendazole (flukicide)		29
Capsules (BZ, IVM, BZ + IVM)	\$2.50–\$3.30	

**Note:** This rough guide to prices is based on information from a number of retail sources. The price of a drench is just one consideration. Remember that the most expensive drench in a particular situation is the one that is unnecessary or ineffective.

Table 4. Long-acting drenches—options

Drench type	Active ingredient	Trade name	Protection against reinfection (days) (label claim)		
			Barber's pole worm	Black scour worm	Small brown stomach worm
<b>Oral</b>	moxidectin	Cydectin®	Not less than 14 <sup>1</sup>	No persistent activity	Not less than 14
<b>Injectable</b>	moxidectin	Eweguard®, Weanerguard® <sup>2</sup>	Not less than 21	Not less than 7	Up to 21 days
		Cydectin Long Acting for Sheep	Not less than 91 days	Up to 49 days	Not less than 91 days
<b>Capsule</b> <sup>3</sup>	ivermectin	Ivomec Maximiser®	100 days against susceptible worm populations.		
	albendazole	Extender®			
	ivermectin/ albendazole	Optamax™			
<b>Closantel-based</b> <sup>4</sup>	closantel	various brands	28	No effect at any stage, but is effective against liver fluke (adults and immatures)	

<sup>1</sup> Cydectin plus Tape, unlike other Cydectin formulations (Cydectin, Cydectin plus Fluke etc.), does not have a claim for persistent activity against barber's pole worm.

<sup>2</sup> Eweguard/Weanerguard also includes a 6-in-1 vaccine (clostridial diseases plus cheesy gland).

<sup>3</sup> Capsules: Do a WormTest mid-way through the capsule payout period and after this period. Unlike ivermectin capsules, albendazole (ABZ, BZ or 'white') capsules can often be used when resistance is present, but it is important to clean out resistant worms with an effective drench or combination of drenches ('primer') when capsules are administered.

<sup>4</sup> Closantel is a narrow-spectrum drench with activity restricted to barber's pole worm, liver fluke and nasal bot. There are also closantel + BZ or ML products on the market.