April 2016

Controlling worms in sheep in the Braidwood region

Dr. Kate Sawford, District Veterinarian for the Braidwood region

Introduction

"Worms cost Australian sheep producers more than any other animal health problem"

This fact has become more evident over the last couple of years with continued significant rainfall. The worms in small ruminants (sheep, goats, and alpacas) like mild to warm, moist conditions and as a result of changes to the weather they are thriving.

While the losses that occur when animals die are obvious, about 80% of the cost of worms in Australia is more insidious, coming from production losses including decreased weight gains, wool production and fertility. These more subtle losses can cost producers $2-$10 per sheep per year.

Drench resistance is a significant issue for all domestic livestock species, but particularly in sheep. It occurs when worms develop the ability to survive a drench dose that previously would have killed them. Drench resistance varies depending on management and drenching practices and geographical location, so the drench resistance on your property will likely differ from that of your neighbour! Once drench resistance develops in a worm population it is likely to stay, which makes following the Worm Control Program even more important to the health of your flock.

The following information and guidelines are provided to help you understand, manage and control sheep worms in our area. The principles and worms are the same for goats. The principles for alpacas are the same, although alpacas can carry worms from sheep and cattle. Specific notes relating to these species are available from the Braidwood office.

To use this guide you will need two additional documents:

1) WormBoss Worm Control Program – NSW non-seasonal rainfall
2) Drench Decision Guide – NSW non-seasonal rainfall

These documents are available on the WormBoss website (wormboss.com.au) under 'Your Program' and 'NSW non-seasonal rainfall'. The WormBoss website is an excellent resource on worm control and is updated regularly.

The worms

There are four main worm species that affect the health of sheep in this region and they can be grouped according to the effects they have on the sheep. Note that by the time a sheep *looks* "wormy" the infection can be severe and the production losses significant.

South East Local Land Services - Braidwood
42 Ryrie Street
Braidwood NSW 2622
Tel: 02 4842 2594 | Fax: 02 4842 2655 | www.lls.nsw.gov.au

Blood suckers:

- Barber's pole worm (*Haemonchus contortus*) – live in the 4th stomach (abomasum)
- Liver fluke (*Fasciola hepatica*) – live in the liver.

These parasites reduce the numbers of red cells in the blood (i.e. anaemia) and lower blood protein (i.e. hypoproteinaemia). Sheep lose condition, become weak, may develop "bottle jaw", and can die. Some animals die suddenly with no obvious warning signs. Those with high burdens of liver fluke can also suffer from severe liver damage.

Ill thrift and scouring:

- Black scour worm (*Trichostrongylus spp*) – live in the first three metres of the small intestine.
- Brown stomach worm (*Teladorsagia circumcinta,* previously called *Ostertagia*) – live in the 4th stomach.

Animals with light to moderate infections of these worms have lower growth rates and produce less wool. If only a few animals in the mob are affected they tend to be "poor doers" and daggy. Those with heavy infections tend to rapidly lose condition, develop scours/diarrhea and can die.

While the Braidwood region is notorious for problems with **barber's pole worm**, we also see significant numbers of black scour worms in sheep.

For the three gut worms (i.e. not liver fluke) adults live inside the sheep's gut laying eggs that are then passed into the environment via the faeces. With adequate warmth and moisture the eggs develop and hatch, producing larvae that then migrate onto pasture leaves. The larvae get eaten by sheep as they graze, develop into adults, begin laying eggs, and the cycle continues. The full cycle can take as little as 3-4 weeks. The life cycle of liver fluke is discussed in a later section.

Other worm species you may have heard of that are *generally* less significant in this area include small intestinal worm (*Cooperia spp*), thin necked intestinal worm (*Nematodirus spp*), lungworm (*Dictyocaulus filaria*), tapeworm (*Moniezia expansa*), nodule worm (*Oesophagostomum columbianum*), large bowel worm (*Oesophagostomum venulosum*), and large mouthed bowel worm (*Chabertia ovina*).

Worm egg count kits

WormTests are kits provided by the State Veterinary Diagnostic Laboratory that are used for conducting worm egg counts (WECs). *WormTests* can be posted to you free of charge by calling 1800 675 623, or picked up at the Local Land Services office in Braidwood. Another source of kits for conducting WECs is Veterinary Health Research (VHR), a private lab located in Armidale. Their kits are also available for pickup in the Braidwood office. Both kits contain instructions on faeces collection and submission to the laboratory.

WECs are the most useful tool we have to measure worm burdens in sheep. To conduct a WEC, collect faeces from the rectums of 10 sheep (fill each container with a sample from an individual animal), or collect samples from a mob in the yards or paddock.

The easiest way to collect samples from a mob is to quietly move them to a grassy corner of a paddock and let them stand still for 10-15 min. A number will poop as they watch you. Lucky

you! Then move closer. As they move away, go to where the mob previously stood and you will find a number of options to sample. Faeces need to be **fresh** – cold, hard pellets are not useful. Pick up faeces from 10 dung piles with the disposable glove provided in the kit, using one of the 10 containers provided in the kit for each dung pile.

Samples should be posted within 24 hours of collection. Prior to posting, keep the kit cool but DO NOT refrigerate as refrigeration can inhibit the hatching of worm eggs. Try to conduct WECs early in the week so that samples don't get stuck in transit over the weekend. At the lab, the worm eggs are counted under a microscope to determine the number of eggs per gram (epg) of faeces, which reflects how many adult worms are living inside the sheep.

At the State Veterinary Diagnostic Laboratory there are a few different types of *WormTests*. In *WormTest* GOLD the eggs in each of the 10 faecal samples are counted separately, giving you a WEC for each individual sheep sampled. In *WormTest* BASIC the faecal samples are mixed into two pools of five faecal samples and then the eggs are counted, giving you an average number of worm eggs in each of the five samples. VHR offers a kit that does the same as the *WormTest* GOLD, but does not have an equivalent to the *WormTest* BASIC. *WormTest* GOLD (or its equivalent at VHR) is recommended in most cases when 10 samples are collected as it provides a better picture of the worm burden of the mob for only a small increase in cost. Certainly *WormTest* GOLD (or its equivalent at VHR) is the best method when doing an egg count after treatment to check on drench efficacy.

If 'count ONLY' is selected on the sample submission form, the epg is determined. If 'type' is selected both the epg and species of worms are determined by hatching the eggs so larvae can be identified and counted, otherwise referred to as a larval culture. Note that the eggs from barber's pole, black scour, and brown stomach worms all look the same under a microscope, so **typing is recommended for most WECs conducted in this area**. Liver fluke egg counts, for which there is an additional charge, need to be requested separately as the counting method is different.

For more information on collecting samples for WECs refer to 'Checking a mob of sheep for worms with a *WormTest*' and 'Worm egg counting' on the WormBoss website.

The decision to drench depends on a number of factors including the class of the sheep, the presence of any signs of disease, geographical location, time of year and recent weather, the egg count, and the percentage of barber's pole worm recovered during the WEC and typing. Drenching unnecessarily is an **unnecessary expense** and could contribute to drench resistance. Refer to the WormBoss Worm Control Program and Drench Decision Guide.

Active ingredients in drenches

Drenches contain one or a combination of active antiparasitic ingredients, or 'actives', that can be grouped into drug groups. Drug groups are generally either broad spectrum, meaning they are effective against a range of worms, or narrow spectrum, meaning they are effective against only one or two types of worms. One or two are referred to as 'mid-spectrum', an example being naphthalophos (Rametin® and other brands), because their spectrum of activity falls between narrow- and broad-spectrum drenches. The effectiveness of the drench groups against **the four main sheep parasites** is outlined below. Some drug groups contain more than one active. Resistance to one drug in a group effectively means resistance to *all* drugs in the group.

BZs, benzimidazoles or "white drenches" – a broad spectrum group of actives that includes oxfendazole, mebendazole, fenbendazole, and albendazole. Effective against susceptible barber's pole, black scour, and brown stomach worms.

MLs, macrocyclic lactones or "mectins" – a broad spectrum group of actives that includes abamectin, doramectin, ivermectin and moxidectin. Effective against susceptible barber's pole, black scour, and brown stomach worms.

Levamisole/morantel, LEV, or "clear drenches" – a broad spectrum group of actives that includes levamisole and morantel. Effective against susceptible barber's pole, black scour, and brown stomach worms.

Monepantel – a broad spectrum active, one of the two newest on the market. Effective against susceptible barber's pole, black scour, and brown stomach worms.

Derquantel – the other new active on the market. Only available in combination with abamectin, it is effective, in combination with abamectin, against susceptible barber's pole, black scour, and brown stomach worms. Because derquantel on its own is a mid-spectrum active, the derquantel/abamectin combination may have reduced but still useful activity against brown stomach worm and/or immature barber's pole worm when there is severe resistance of worms to abamectin. At the time of this writing (April 2016), resistance to derquantel itself has not been reported.

Naphthalophos – a mid-spectrum active. Effective against susceptible adult barber's pole worm, with some activity against susceptible black scour, small brown stomach, and immature barber's pole worms. Most often used in combination with other drench actives.

Closantel - a narrow spectrum active. Effective against susceptible barber's pole worm, and late immature and adult liver fluke.

Triclabendazole – a narrow spectrum active. Effective against susceptible immature and mature liver fluke.

Oxyclozanide – a narrow spectrum active. Effective against susceptible mature liver fluke.

Combinations of actives from different drug groups are available that have a broad spectrum of activity. Combinations include a BZ plus LEV, a BZ plus a LEV plus a ML, a ML plus an active for liver fluke, and a ML plus naphthalophos.

WormBoss Control Program Summary

It is very worthwhile to read the whole of the WormBoss Control Program. It has five main components that are effective for worm control in this region **when used in combination**. The main components, with detail relevant to the Braidwood region, include:

1. Use grazing management to create low worm-risk paddocks

    - Prepare low worm-risk paddocks for lambing and weaning by preventing contamination with worm larvae in the 2 to 5 months (depending on temperature) before they are needed. In this time, spell paddocks, or graze with sheep only in the 0–21 days after a drench known by testing to be highly effective, or graze with cattle. In addition to drenching, cross grazing with cattle is probably the most effective and practical option in our area to help control worms. It relies on the fact that most worms in sheep are only able to infect sheep, and vice versa for cattle! The main exceptions are liver fluke and occasionally barber's pole worm. If you're going to cross graze with cattle try to do so

with adult cattle as opposed to cows and calves. See page 5 of the WormBoss Worm Control Program.

- Use ‘Smart grazing’ to prepare winter weaner paddocks. This process involves grazing, often at higher stocking rates, with sheep 0-21 days after an effective drench. See page 18 of the WormBoss Worm Control Program.

2. Breed and feed for worm-resistant and resilient sheep
    - Use rams with better than average worm egg count (WEC Australian Sheep Breeding Values or WEC ABSVs) and less dagginess (DAG ASBVs); choose the more negative values for both. See page 6 of the WormBoss Worm Control Program.
    - Maintain sheep in good body condition on high-quality feed to enhance their immunity to worms.
    - Correct any selenium and/or copper deficiencies.
3. Conduct WECs and typing at recommended times. See pages 7 to 9 of the WormBoss Worm Control Program.
    - From March until October, 4–6 weeks after significant rain that has follow-up rain, including the autumn break.
    - Young sheep in May/June before the more severe winter weather arrives.
    - Pre-lambing. Be sure to include a typing if barber’s pole worm has been a problem in the past year.
    - Prior to other management activities (such as crutching, joining, shearing and weaning).
    - At 6–8 week intervals after a drench was given (in addition to a possible DrenchCheck: see below).
    - Use the Drench Decision Guide with the WEC results to make drenching decisions.
4. Drench at recommended times. See pages 7 to 9 of the WormBoss Worm Control Program.
    - The ‘first summer drench’. All sheep receive this drench when pastures are haying off in late spring. In very dry or drought years do a WEC beforehand as even this drench may be unnecessary and may cause increased selection for drench resistance.
    - Lambs at weaning. This may coincide with the ‘first summer drench’. Autumn-drop lambs may also need an additional drench 8 weeks after weaning.
    - Drench all introduced sheep with an effective drench or drenches that provide four actives (see the table at the end of this document). Using a combination of unrelated actives is most likely to be effective.
    - Drench sheep showing obvious signs of worm-related illness (weight loss, pale skin and eyes, bottle-jaw, scouring).
    - At other times, use the Drench Decision Guide to make decisions.
5. Manage drench resistance. See pages 10 to 13 of the WormBoss Worm Control Program.
    - Conduct *DrenchTests* every 2–3 years. These tests involve measuring the worm burden of a mob of sheep and then treating each group within the mob with a drench likely to be used on your farm followed by a WEC on each group. It allows you to select the most

effective drenches on your property, which slows drench resistance. See 'Testing drench effectiveness with a *DrenchTest*' on the WormBoss website for further details.

- Use a *DrenchCheck-Day10* between *DrenchTests* to check the effectiveness of individual drenches. This test involves doing two WECs, one prior to drenching (usually at a routine WEC time) and another 10-14 days after the drench. See 'Testing drench effectiveness with a *DrenchCheck-Day10*' on the WormBoss website for further details.
- **Don't drench unnecessarily**, especially adult sheep.
- Use **effective drenches** and **rotate among all effective drench groups** for each mob (and each paddock where possible). **Rotation must be between actives from different drench groups.** For example, drenching with moxidectin followed by abamectin, both MLs, is NOT an appropriate way to manage resistance.
- Use **broad spectrum combinations** where possible.
- In general, **use short-acting treatments**. Only use mid-length and long-acting products for specific purposes and at high worm-risk times. Use primer and exit drenches should you use these products. See the end of the Drench Decision Guide for further details.
- **Do not underdose** – calibrate your drench guns, dose to the heaviest sheep and follow label instructions.
- When moving sheep to a new paddock only drench if required, for example if the program specifies it is a routine drench, or a WEC indicates that drenching is required. In certain situations you may be moving sheep to very clean paddocks. This circumstance could occur, for example, in very dry years when the paddock has been spelled for a long time, or it might be a cereal stubble in summer that has not been grazed since planting. In these cases there are few worm larvae on the paddock (i.e. few worms 'in refugia') and drenching and moving at the same time may increase selection for resistance. To reduce selection for resistance, move sheep to the new paddock first, graze for 1-3 weeks depending on seasonal conditions (shorter when conditions are good for barber's pole worm), and then drench. See page 12 of the WormBoss Worm Control Program.

How do I know if I have liver fluke and what do I do?

Liver fluke is quite different from the other worms in that it requires two hosts to complete its life cycle, the sheep (or other final host including cattle) and its intermediate host, small freshwater snails. While the other main worms are found on virtually ALL properties in this district, liver fluke only occurs where its intermediate host is found, namely slow-moving creeks, swamps and springs. However, liver fluke is not present in all such areas.

Treating for liver fluke is expensive, and therefore it is worth figuring out if you have it on your property. If the liver fluke status of your property is unknown, test three times a year (autumn, winter and summer) for at least two years and look for evidence of liver fluke in the livers of any sheep that die on your property.

There are two commonly available tests for liver fluke, an egg count as part of a WEC kit and a blood test. Any positive fluke egg count is significant, regardless of the number of eggs, and indicates treatment is needed. The blood test costs less than the egg count and is better at detecting sheep with liver fluke. Your local veterinarian will be able to help collect blood from

suitable sheep for the liver fluke blood test. Finally, there is a relatively new test from Europe that detects liver fluke 'antigen' (bits of liver fluke), as opposed to eggs, in faeces. It is available through a veterinary lab in Wagga Wagga (Charles Sturt University). Contact your local veterinarian for more information.

If all six tests are negative and post mortem examinations of sheep show no signs of liver fluke, it is likely that your property does not have the necessary snail species, or the snails haven't been infected with liver fluke. In this instance only drench sheep brought onto your property for liver fluke.

Positive results at all testing times indicate that your property carries a significant burden of liver fluke. In this instance, discontinue further testing and routinely treat for liver fluke at three times of year:

- April-May
- August-September
- February

The April-May and February treatments should be based on triclabendazole as it is effective against all stages of the fluke. For other treatments rotate between other unrelated fluke drenches.

If results at the six testing times are not always positive, then continue testing at specified times to decide whether to drench. With ongoing monitoring you may be able to revise the number of fluke drenches you need to give each year. Properties with fewer liver fluke problems may only need one or two treatments per year, the most important of which is the April/May fluke drench.

Drench resistance is increasingly becoming a problem in liver fluke. To check the efficacy of a fluke drench using liver fluke egg counts test on or just before giving a fluke drench and then again 21-28 days.

For more information see pages 14 to 15 of the WormBoss Worm Control Program.

Where do I start – a rough guide for the area

The following is a **rough guide** working from the principles of the WormBoss program. It is based on a **Merino spring lambing enterprise** (September), with weaning happening in December, 12-14 weeks from the start of lambing. For Merino enterprises add or subtract months to suit your enterprise. Note that the timing of drenches for fluke should not change.

The fluke drenches are numbered one to three according to their importance, one being the most important, should you have fluke on your property.

Month	WEC and typing?	Drench?	Drench type
February – the 2nd summer drench	Ewes – yes	Subject to WEC and typing	Broad spectrum (+/- fluke #3, triclabendazole)
	Lambs – yes	Subject to WEC and typing	Broad spectrum (+/- fluke #3, triclabendazole)
March/April (esp if wet summer)	Ewes – yes	Subject to WEC and typing	Broad spectrum
	Lambs – yes	Subject to WEC and typing	Broad spectrum
May (after first frosts)	Ewes – yes	Subject to WEC and typing	Broad spectrum (+/- fluke #1, triclabendazole)
August	Ewes (prelambing) and previously few barber's pole worm – yes	Subject to WEC and typing	Broad spectrum (+/- fluke #2, closantel or oxyclozanide)
	Confirmed issues with barber's pole worm – no	Yes	Broad spectrum (+/- fluke #2, closantel or oxyclozanide)
October (early)	Ewes – yes	Subject to WEC and typing at lamb marking	Broad spectrum
November (mid) - the 1st summer drench	Ewes – no	Yes	Broad spectrum
	Lambs – no	Yes	Broad spectrum
December (mid-late)	Ewes – yes	Subject to WEC and typing	Broad spectrum
	Lambs being weaned – no	Yes	Broad spectrum

The following is a **rough guide** working from the principles of the WormBoss program. It assumes a **first cross autumn lambing enterprise** (May), with weaning happening 12-14 weeks from the start of lambing in August. For first cross enterprises add or subtract months to suit your enterprise. Note that the timing of drenches for fluke should not change.

The fluke drenches are numbered one to three according to their importance, one being the most important, should you have fluke on your property.

Month	WEC and typing?	Drench?	Drench type
February – the 2nd summer drench	Ewes – yes	Subject to WEC and typing	Broad spectrum (+/- fluke #3, triclabendazole)
April	Ewes (prelambing) and previously few barber's pole worm – yes	Subject to WEC and typing	Broad spectrum (+/- fluke #1, triclabendazole)
	Confirmed issues with barber's pole worm – no	Yes	Broad spectrum (+/- fluke #1, triclabendazole)
June (after first frosts)	Ewes – yes	Subject to WEC and typing	Broad spectrum
August	Ewes – yes	Subject to WEC and typing	Broad spectrum (+/- fluke #2, closantel or oxyclozanide)
	Lambs being weaned – no	Yes	Broad spectrum (+/- fluke #2, closantel or oxyclozanide)
October (early)	Ewes – yes	Subject to WEC and typing	Broad spectrum
	Lambs – yes	Subject to WEC and typing	Broad spectrum
November (mid) - the 1st summer drench	Ewes – no	Yes	Broad spectrum
	Lambs – no	Yes	Broad spectrum
December (mid-late)	Ewes – yes	Subject to WEC and typing	Broad spectrum
	Lambs (if present)	Subject to WEC and typing	Broad spectrum

The more WECs you do the better, especially if worm control is new to you, or if we are having an "atypical season" as they will help give you a more accurate picture of how your worm management is going. You can't do too many WECs, however you can certainly drench too often, and not often enough. As a guide, do WECs every 4 weeks in good conditions (warm and wet) and every 6-8 weeks if cool/cold/dry.

Further information

- WormBoss worm control program – http://www.wormboss.com.au/programs/nsw/introduction.php
- WormBoss worm control program – NSW non-seasonal rainfall - http://www.wormboss.com.au/files/pages/programs/nsw/appendices/worm-control-program/WB_Program_Pages_NSW_NON_SEASONAL_30_June_2012_for_web.pdf
- Drench decision guide – http://www.wormboss.com.au/files/pages/tests-tools/management-tools/drench-decision-guide/nsw/WB_DDG_NSW_NON_SEASONAL_16_November_2012.pdf
- Checking a mob of sheep for worms with a WormTest – http://www.wormboss.com.au/tests-tools/tests/checking-a-mob-of-sheep-for-worms.php
- Testing drench effectiveness with a DrenchTest – http://www.wormboss.com.au/tests-tools/tests/checking-a-mob-of-sheep-for-worms.php
- Checking for drench resistance with a *DrenchCheck-Day10* – http://www.wormboss.com.au/tests-tools/tests/checking-for-drench-resistance.php
- When to Wormtest – http://www.wormboss.com.au/programs/nsw/when-to-wormtest-and-when-to-drench.php

Table of antiparasitics currently registered to treat worms in sheep

This table was generated in December 2015 and is based on currently registered products. It is intended as a **GUIDE ONLY.** Exhaustive information on product claims, contraindications, and withholding periods is not provided. Consult labels for more detailed information.

Please be sure to read the packaging carefully and follow dosage and administration instructions closely. You must only use a product according to the label on it unless you have received written instructions from a veterinarian to use it in another way.

It is critical to adhere to the relevant withholding periods and export slaughter intervals. For the most up-to-date information see the Australian Pesticides and Veterinary Medicines Authority (APVMA) product database - https://portal.apvma.gov.au/pubcris

Active ingredients in the benzimidazoles or "white drenches" family are indicated next to the active ingredient by a '*BZ'*. Active ingredients in the macrocyclic lactones or "mectins" family are indicated next to the active ingredient by a '*ML'*. Active ingredients in the leviamisole/morantel or "clear drenches" family are indicated next to the active ingredient by an *'LEV'.*

Most drenches in sheep are administered **orally.** Products that are administered via injection (*Inj*), pour-on (*P-on*), or oral capsule (*OrC)* are indicated next to the short trade name.

Most drenches are **short acting,** or have a short duration of action**.** Products that are mid-length (*Mid-L*) or long-acting (*LA*) are indicated next to the short trade name.

Some of these drenches have activity against external parasites. For example, drenches in the "mectins" family are known to have activity against nasal bot and itch mite, while closantel has activity against nasal bot. Consult labels for further information.

Most products cannot be used in lactating animals that are used, or likely to be used, to produce milk for human consumption. Always check the label.

Some products, notably those containing only naphthalophos, can be mixed with other drenches on-farm. Check product labels.

All listed products were registered In December 2015, however availability is not guaranteed.

Short trade name	Active ingredient(s)	Targeted worm species of significance to this region
Abamectin Abamectin Baymec LV ABsolute Drench	Abamectin[ML]	Barber's pole, black scour, and brown stomach worms
Alben	Albendazole[BZ]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
Albendazole Sheep, Lamb and Goat Drench	Albendazole[BZ]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
All Farm Benzicare	Mebendazole[BZ]	Barber's pole, black scour, and brown stomach worms

Short trade name	Active ingredient(s)	Targeted worm species of significance to this region
Ausmectin Sheep Drench	Ivermectin[ML]	Barber's pole, black scour, and brown stomach worms
Avomec Duel[Int]	Abamectin[ML] Closantel	Barber's pole, black scour, and brown stomach worms, liver fluke from 8 weeks of age
Bionic[LA, OrC]	Abamectin[ML] Albendazole[BZ]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
Centagard[LA, OrC]	Albendazole[BZ]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
Closantel[Int] Closicare with Selenium[Int]	Closantel	Barber's pole worm, liver fluke from 8 weeks of age
Combat	Naphthalophos	Barber's pole, black scour, and brown stomach worms
Combination	Fenbendazole[BZ] Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Combinator LV Plus Selenium Oral Anthelmintic For Sheep	Fenbendazole[BZ] Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Combo LV Anthelmintic for Sheep	Fenbendazole[BZ] Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Cydectin Eweguard 6 in 1 Vaccine and Wormer for Sheep[Int, Inj] Cydectin Eweguard 6 in 1 Vaccine and Wormer with Selenium and Vitamin B12 for Sheep[Int, Inj]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
Cydectin Long Acting Injection for Sheep[LA, Inj]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
Cydectin LV Drench for Sheep[Int] Cydectin LV Se Low Volume Oral Drench for Sheep with Selenium[Int] Cydectin Oral Drench for Sheep[Int]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
Cydectin Plus Fluke Oral Solution For Sheep[Int]	Moxidectin[ML] Triclabendazole	Barber's pole, black scour, and brown stomach worms, immature and mature fluke

Short trade name	Active ingredient(s)	Targeted worm species of significance to this region
Cydectin Plus Tape Oral Drench and Tapeworm Treatment for Sheep and Lambs	Moxidectin[ML] Praziquantel	Barber's pole, black scour, and brown stomach worms
Cydectin Se Oral Drench for Sheep[Int]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
Cydectin Weanerguard 6 in 1 Vaccine and Wormer for Sheep[Int, Inj] Cydectin Weanerguard 6 in 1 Vaccine and Wormer with Se & B12[Int, Inj]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
Duocare LV plus Selenium Duocare plus Selenium	Levamisole[LEV] Fenbendazole[BZ]	Barber's pole, black scour, and brown stomach worms
Dynamax Controlled Release Capsules for Adult Sheep[L]	Abamectin[ML] Albendazole[BZ]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
Ensign SE Oral Drench for Sheep with Selenium[Int]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
Extender Junior[L] Extender SeCo[L]	Albendazole[BZ]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
Fasimec Sheep	Triclabendazole Ivermectin[ML]	Barber's pole, black scour, and brown stomach worms, nasal bot, immature and mature fluke
Fasinex 100	Triclabendazole	Immature and mature fluke
Fenbendazole	Fenbendazole[BZ]	Barber's pole, black scour, and brown stomach worms
First Drench	Levamisole[LEV] Praziquantel	Barber's pole, black scour, and brown stomach worms
Firstmectin Firstmectin Se	Abamectin[ML] Praziquantel	Barber's pole, black scour, and brown stomach worms
Flukamec Plus Selenium	Triclabendazole Abamectin[ML]	Barber's pole, black scour, and brown stomach worms, immature and mature fluke
Flukare C Plus Selenium	Triclabendazole	Immature and mature fluke
Flukazole C plus Selenium	Triclabendazole Oxfendazole[BZ]	Barber's pole, black scour, and brown stomach worms, immature and mature fluke
Genesis Drench with Selenium	Ivermectin[ML]	Barber's pole, black scour, and brown stomach worms

Short trade name	Active ingredient(s)	Targeted worm species of significance to this region
Genesis Injection[Int, Inj] Genesis Injection Abamectin Plus Vitamin B12[Int, Inj]	Abamectin[ML]	Barber's pole, black scour, and brown stomach worms
Genesis Tape	Abamectin[ML] Praziquantel	Barber's pole, black scour, and brown stomach worms
Genesis Xtra Drench[L]	Abamectin[ML] Closantel	Barber's pole, black scour, and brown stomach worms, liver fluke from 8 weeks of age
Hat-Trick Drench	Abamectin[ML] Oxfendazole[BZ] Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Ivomec Liquid for Sheep Ivomec Liquid with Selenium for Sheep	Ivermectin[ML]	Barber's pole, black scour, and brown stomach worms
Ivomec Maximizer[LA, OrC]	Ivermectin[ML]	Barber's pole, black scour, and brown stomach worms
Levamisole Levamisole Gold Levamisole Gold Low Volume	Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
LV Combination	Levamisole[LEV] Fenbendazole[BZ]	Barber's pole, black scour, and brown stomach worms
LV Levamisole	Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Maverick Pour-On for Sheep[P-on]	Abamectin[ML]	Barber's pole, black scour, and brown stomach worms
Maximus Long Acting Injection for Sheep[LA, Inj] Maximus Plus Selenium Moxidectin Drench for Sheep[LA, Inj]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
Moximax Plus Selenium Oral Drench for Sheep[Int] Moxitak Se LV[Int] Moxitak Se Oral[Int]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
NAPfix	Naphthalophos Albendazole[BZ] Abamectin[ML]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
Nilverm LV Nilverm Oral	Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms

Short trade name	Active ingredient(s)	Targeted worm species of significance to this region
Nilzan LV	Levamisole[LEV] Oxyclozanide	Barber's pole, black scour, and brown stomach worms
Noromectin Liquid Noromectin Plus Selenium Liquid for Sheep	Ivermectin[ML]	Barber's pole, black scour, and brown stomach worms
NuCombo	Fenbendazole[BZ] Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Oralject Goat and Sheep Wormer	Morantel[LEV]	Barber's pole, black scour, and brown stomach worms
Ovimectin LV	Abamectin[ML]	Barber's pole, black scour, and brown stomach worms
Oxfen LV	Oxfendazole[BZ]	Barber's pole, black scour, and brown stomach worms
Panacur 25	Fenbendazole[BZ]	Barber's pole, black scour, and brown stomach worms
Paramax Multi-Purpose Concentrate for Sheep	Ivermectin[ML]	Barber's pole, black scour, and brown stomach worms
Paramectin Mineralised	Abamectin[ML]	Barber's pole, black scour, and brown stomach worms
Pyrimide 3-Way Combination Drench for Sheep	Abamectin[ML] Levamisole[LEV] Albendazole[BZ]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
Q-drench Multi-Combination Drench for Sheep	Levamisole[LEV] Closantel Albendazole[BZ] Abamectin[ML]	Barber's pole, black scour, and brown stomach worms, liver fluke from 8 weeks of age
Rametin Combo Sheep Drench Mix Pack	Naphthalophos Fenbendazole[BZ] Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Rametin Sheep Drench	Naphthalophos	Barber's pole, black scour, and brown stomach worms
Scanda Mineralised	Levamisole[LEV] Oxfendazole[BZ]	Barber's pole, black scour, and brown stomach worms
Scandamax	Levamisole[LEV] Oxfendazole[BZ] Ivermectin[ML]	Barber's pole, black scour, and brown stomach worms
Sequel	Abamectin[ML] Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Sheepguard SE Oral Drench for Sheep[Int]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms

Short trade name	Active ingredient(s)	Targeted worm species of significance to this region
Startect Broad Spectrum Oral Drench for Sheep	Derquantel Abamectin[ML]	Barber's pole, black scour, and brown stomach worms
Switch Drench	Levamisole[LEV] Fenbendazole[BZ]	Barber's pole, black scour, and brown stomach worms
Sykes BIG L Worm Drench for Sheep & Cattle	Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Topdec Plus Selenium Oral Drench for Sheep[Int]	Moxidectin[ML]	Barber's pole, black scour, and brown stomach worms
Tremacide 120 Flukicide for Cattle and Sheep	Triclabendazole	Immature and mature fluke
Trifecta Triple Active Drench	Abamectin[ML] Levamisole[LEV] Oxfendazole[BZ]	Barber's pole, black scour, and brown stomach worms
Triguard Triple	Abamectin[ML] Oxfendazole[BZ] Levamisole[LEV]	Barber's pole, black scour, and brown stomach worms
Valbazen Broad Spectrum Sheep, Lamb and Goat Drench	Albendazole[BZ]	Barber's pole, black scour, and brown stomach worms, liver fluke from 12 weeks of age
Virbamec Oral for Sheep Virbamec Oral LV for Sheep Virbamec Oral Plus Selenium for Sheep	Abamectin[ML]	Barber's pole, black scour, and brown stomach worms
Zolvix Monepantel	Monepantel	Barber's pole, black scour, and brown stomach worms
Zoomec Zoomec plus Selenium	Abamectin[ML]	Barber's pole, black scour, and brown stomach worms