



Sheep worms - testing drench resistance and effectiveness

Rob Woodgate, Veterinary Officer, Albany and Di Evans, Development Officer, Denmark

Introduction

Producers have relied heavily on drench chemicals to manage sheep worms but in Western Australia, worms have become increasingly resistant to drenches over the past 15 years. Resistance to the newest drench group, the macrocyclic lactone (ML) group (ivermectin, abamectin, moxidectin), was first detected in 1991.

Drench resistance

Drench resistance is a major limiting factor to profitable and sustainable sheep and wool production and, as no new drench groups are likely to be developed for at least the next few years, it is important that we preserve the few remaining effective drenches. Non-chemical based strategies should also be used to combat worms including breeding worm resistant sheep and grazing management to minimise exposure of the most vulnerable sheep to heavily contaminated paddocks.

A major cause of drench resistance in Western Australia is drenching during the hot, dry summer. New strategies to slow the rate of development of resistance emphasise the need to modify summer drenching practices and if possible not to summer drench some older less susceptible mobs of sheep. Some classes of sheep,

such as weaners, could still require a routine summer drench, and in these cases only a fully effective drench should be used. Using less than fully effective drenches will not control worms, and will lead to production losses and increased resistance. Fully effective drenches can be identified by a drench resistance test which is an important part of a worm control program.

Drench resistance test

The drench resistance test [also known as the Faecal Egg Count Reduction Test (FECRT)] is used to determine the effectiveness of the various drenches. This test can be used to check any drench group.

It is recommended that a drench resistance test be carried out at least every two years to monitor drench performance. A veterinarian or animal health adviser should be contacted to plan the test and arrange the worm egg counting.

Method

Select appropriate sheep

The sheep used for the test should be young and undrenched. Undrenched lambs, at least 12 weeks old are best. If sheep older than five months of age are used,

Table 1: Estimate of prevalence of drench resistance

<i>Drench group</i>	<i>Estimated prevalence of drench resistance</i>
BZ drenches (Benzimidazole, white) (e.g. Valbazen, Panacur, etc.)	99 per cent of WA properties
LV drenches (Levamisole, clear) (e.g. Nilverm, Levamisole, etc.)	99 per cent of WA properties
BZ/LV combination drenches (e.g. Scanda, Nucombo, etc.)	70 per cent of WA properties
Macrocyclic lactone (ML) – ivermectin, abamectin, moxidectin (e.g. Ivomec, Paramax, Rycomectin, Virbamec, Cydectin)	40 per cent of WA properties
Naphthalophos (OP) (e.g. Rametin)	Only one recorded case in Australia
Closantel (e.g. Seponver, Closal, etc.)	Resistance in <i>Haemonchus contortus</i> (barber's pole worm) is common in northern NSW and south-east Queensland

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the test may need to be modified and it is best to discuss this with your vet or adviser.

Do a preliminary worm egg count

Before starting the drench resistance test, collect dung samples, using the paddock method (see Farmnote 54/2002 Sheep worms – faecal worm egg counts), from at least 10 sheep in the mob to be tested. These will be used for a faecal worm egg count and worm larval culture to determine if enough worms of the right species are present in the mob to continue with the test. If barber's pole worm is present it may need to be removed by drenching with closantel to prevent interference with the test for scour worm resistance. The recommended minimum average egg count of the mob is 300 eggs per gram for a drench resistance test to proceed but this should be confirmed with your local vet or adviser.

Decide the drenches to test

Deciding which drenches to test will depend on results from previous tests and the drench usage pattern on your property. Again, discuss this with your local vet or adviser prior to doing the test. The following can be used as a guide:

- BZ/LV (white/clear) combination.
- Half dose ivermectin (to check for indications of ML resistance - **not** for normal drenching).
- Full dose abamectin or moxidectin (depending on likely treatment choices).
- Rametin mixtures (such as with BZ, LV or BZ/LV).
- No drench (to act as a control group).*

*An untreated control group must be included.

Set up the test groups

Select sheep by randomly drafting them into separate groups of 15, with each group representing a drench to be tested and one undrenched (control) group. Include sheep that are of similar size.

Identify the sheep in each group so that they can be sampled again in 10 to 14 days (see Step 6 below). To do this, it is best to mark the sheep by using spray mark or tag the sheep in each group with a colour that is specific for that group.

Drench each group

Once the groups have been drafted off and identified, weigh a couple of the largest sheep in each group. Calculate the dose for the group using the average weight of the largest sheep. Drench each group with the appropriate drench. Do not drench the sheep in the control group.

It is important to ensure that all of the sheep tested receive the correct dose. Check dose calculations and calibrate drench guns to ensure the right dose is given. Drench the sheep carefully to make sure all animals receive the full amount of drench.

Return sheep to the paddock

Following treatment, the sheep can be run together or as part of any other mob of sheep until it is time for post-treatment sampling.

Collect faecal samples for worm egg counting

Between 10 to 14 days after treatment (the correct timing of this post-treatment sampling is important to get a useful result) re-muster the sheep and collect 10 individual faecal samples from each group, including from the sheep in the untreated control group. Fifteen sheep were initially treated in each group to allow a few spares in case a post treatment faecal sample could not be obtained from some individuals.

Submit the faecal samples as directed by your veterinarian or adviser. Request a larval culture and differentiation on samples from each group.

Important: Give a clean-out drench with a full dose of a fully effective drench to the sheep previously treated with the half dose of ivermectin.

Interpreting results

For each drench group, the average number of faecal eggs of each of the main worm species is compared to the average number of eggs for each worm species in the faeces from the control group sheep. This indicates the effectiveness of the various products that have been tested. Your veterinarian or adviser will do this calculation for you and also help with interpreting the results.

A fully effective drench is one that shows at least 95 per cent reduction in the number of worm eggs compared to the undrenched control group.

Testing drench effectiveness

A rough indication of the effectiveness of a drench can also be determined through worm egg counts before and after a drench is given, if it is not possible to do a full drench resistance test at the necessary time. The first faecal worm egg count should be carried out about a week before the drench is planned to be given to allow time for the results to be completed, as they may indicate that a drench is not needed. This is done by using the 'paddock method' to collect at least 10 individual fresh faecal samples from the mob.

Treat the mob if the worm egg count result indicates a need for drenching. Then, 10 to 14 days after drenching, collect another 10 fresh faecal samples at random from the same mob for a second faecal worm egg count. The post-treatment result can be compared with the pre-treatment result to work out the percent effectiveness of the drench given.

Further information

Farmnote 51/2002 Sheep worm control in Western Australia.