NSW DPI SHARING INFORMATION ON ENDOPARASTES OF FARM ANIMALS

turning the worm

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IN THIS ISSUE

FROM THE EDITOR

Welcome to this issue of TTW.

The main purpose of this informal newsletter is to share information with those interested in the management of endoparasites of farmed animals, including sheep, goats and cattle.

In line with current conventions, acknowledge authors and include details of this newsletter (title, issue, editor).

WORMMAIL VS TURNING THE WORM

As noted above, Turning the Worm is a newsletter for sharing worm management related information, especially information that otherwise would have a limited circulation or not otherwise be readily accessible. It is published on the Industry and Investment-NSW (Primary Industries) website and, is a registered serial (ISSN 1442-8466). See http://www.nla.gov.au/services/issn.html and http://trove.nla.gov.au/.

Normally we aim to publish TTW 3-4 times a year, but for various reasons this is the only issue for 2009.

WormMail is the name of a mailing list, and serves as a conduit:

- WormFax, which is mailed (through the WormMail list) as well as posted on our website
- Issues of Turning the Worm
- Occasional, usually weekly, updates, which are referred to as 'WormMails', and of late have also been posted to http://wormmailau.wordpress.com/ .

Much of the content that normally would have been published in TTW has this year been published in WormMails. This issue of TTW contains some information already sent out as WormMails.

To subscribe to WormMail, go to: http://www.dpi.nsw.gov.au/agriculture/livestock/sheep/health/internal/worm-mail

WORMBOSS

WormBoss is a national repository of information and guidance on sheep worm management.

In recent months its home has moved from www.wormboss.com.au to the Australian Wool Innovation (AWI) site, www.wool.com/wormboss .

There have been some issues since the move, but please be patient: with the assistance of AWI information technology staff, we are working on ironing them out.

Have you subscribed to the monthly WormBoss News/Outlooks? If not, subscribe at the website.

NOTES ON MONEPANTEL

Dr Tony Morton, District Veterinarian, Hume Livestock Health and Pest Authority[1].

"Recently Bruce Watt and I attended a key opinion leader meeting organised by Novartis at Wagga regarding Zolvix® (monepantel). There was a range of DPI, CSU vets, consultants, leading resellers etc present. I attended as the southern internal parasites representative for NSW District Veterinarians. It was a fascinating meeting.

Bruce did an excellent press release from the meeting (I pasted below it below. –Ed.).

[1] www.lpha.org.au

A few dot points I noted (and have been commented on by Justin Bailey of Novartis) which you may find of interest include:

- works on all resistant nematodes
- aiming to develop a test that finds resistant alleles earlier than faecal egg count reduction test
- effective (higher) dose rate published re goats
- pre treatment fasting yielded no significant benefit (Refer to work of the late Des Hennessy showing benefits of feed restriction when treating with BZs, closantel, MLs (but not LEV, and should not restrict feed before/after OP drenches. Also where the drench gun is placed in the mouth. See DrenchPlan Primefact, www.dpi.nsw.gov.au – Ed).
- as a quarantine treatment: zero worm eggs in faeces by about 48 hours (n.b. monepantel is not ovicidal)
- very safe, 800x normal dose = LD50
- Meat withholding period in New Zealand is 7 days
- It will be marketed (initially) as a single compound not as a combination (why? high efficacy and safety profile, new chemistry (takes time), global market- no combos registered in Europe).
- computer modelling for main roundworm (Teladorsagia/Trichostrongylus) species at Hamilton, Victoria showed the best rotation was monepantel and a triple combo. The modelling also indicates the long acting effect of moxidectin promotes resistance. It also showed that at Hamilton not drenching 10% of the mob had little effect on the development of resistance (this was different from WA with its hot dry summer)
- work done by Dave Leathwick in NZ which showed that to achieve the same dilution of resistant alleles (when drenching onto identical pasture) attained by leaving 1% untreated with a 99.9% effective drench, would require leaving 5% untreated with a 99% effective drench or 34% untreated with a 95% effective drench.
- Nick Sangster's (Charles Sturt Uni.) modelling (Sangster and Dobson) suggests that with the two new actives coming on the market if they are rotated it will take about 7.5 years for resistance to emerge, if used in combination there would no resistance after 20 years.

See the CSU web site for further details:

http://www.csu.edu.au/faculty/science/savs/research/whatsnew.htm

(Also see: http://wormmailau.wordpress.com/2009/08/26/managing-new-anthelmintics-sangster/– Ed.).

Nick Sangster commented: "The modelling makes some assumptions about ideal components of a combination which we can't be sure occurs. Nevertheless it illustrates a principle. Dave Leathwick discusses it in his paper (referred to in the talk)".

The latest AVJ (Nov 2009) has an excellent article on the efficacy of Zolvix (monepantel) in sheep".

(The article above was originally in WormMail Issue 20091126, archived at http://wormmailau.wordpress.com/2009/11/26/monepantel-notes-first-new-drench-in-25-years-pathology-of-tape-and-round-worms-cydectin-la-etc-worlds-oldest-sheep-flystrike-webpage-sweet-poison-dr-godwin-on-sustainability-wormmail-2/)

MANAGING THE FIRST NEW DRENCH IN 21 YEARS

Dr Bruce Watt, Senior District Veterinarian, Tablelands LHPA

(Article for local (Bathurst) newspaper. Republished with permission).

In 1988, Nick Greiner ousted Barry Unsworth in the NSW state election. Our Prime Minister Bob Hawke stood by (but didn't touch) the Queen as she helped us commemorate the bicentenary of the landing of the First Fleet by opening the New Parliament House in Canberra. Duncan Armstrong won gold in Seoul but we lost the Bledisloe Cup 2-0. And the last drench from a new group, ivermectin, was launched in Australia.

A new drench group is therefore big news. I recently joined a group of vets, consultants and farmers in Wagga to hear Novartis company veterinarians lead a discussion on how we might best manage their new product, Zolvix® (monepantel), one of two completely new drenches to be released in the near future.

Dr Stephen Love (I&I, Armidale) told us that it usually takes about five years from the release of a new chemical group drench for the first signs of resistance to appear. Unusual exceptions however do occur. As I have mentioned previously worms have been very slow to develop resistance to the organo-phosphate drenches, just as lice have been very slow to develop resistance to OPs and flies to cyromazine (Vetrazin®, and now generics).

Nick Sangster, professor of veterinary pathobiology at Charles Sturt University, gave us a summary of management practices that are likely to enhance the development of chemical resistance in worms.

He listed the failure to administer a quarantine drench to newly purchased stock, the use of long acting products, drenching before moving to very clean pastures (especially stubbles), the treatment of ewes prior to lambing and finally under dosing and drenching excessively as the most likely factors.

However, internal parasite management is a juggling act between controlling worms in sheep for enhanced health and production and drenching sensibly to avoid resistance.

We all agreed that we would like to see Zolvix® used responsibly to delay resistance and to help in worm control. Extensive trial data from both Australia and elsewhere show that it is highly effective against a wide range of worms including those resistant to other drenches.

It is also non-toxic and easy to administer. For sheep producers the only bad news is that it will not be cheap. While Australian pricing has not been disclosed, I am told you can expect to pay a premium for Zolvix®.

So how might (NSW central) tablelands sheep producers use monepantel? As most still have at least three effective drench types to choose from (abamectin/moxidectin, the OP combinations and the triple combinations), they are not yet backed into a corner on resistance (unlike some of their New England counterparts).

However, I think many rely heavily on abamectin and moxidectin. Monepantel will be a useful alternative to the OP combinations for those who would like to extend the life of moxidectin on their farms.

The first summer drench, due now, would be an appropriate time to use monepantel, although perhaps not this season as it is not yet released. It would also be most useful as a drench for young sheep that require a lower and so less expensive dose and where its safety and effectiveness would be valuable.

WORMKILL, RECIPES AND OTHER FURPHIES

Stephen Love (with comment by **Keith Dash**)

The following is from WormMail e-newsletter 20090604 which can be found at http://wormmailau.wordpress.com/2009/06/04/mud-maps-misconceptions/

Also included is a response from Dr KM Dash, the 'father' of WormKill.

There are various misconceptions about WormKill, some of them amusing.

WormKill was the first of the 'modern' strategic sheep worm control programs, being developed for the *Haemonchus*-endemic area of NE NSW by CSIRO scientist Keith Dash, building on the pioneering work of CS(I)R(O) scientist H McL Gordon. Three critical factors for the success of WormKill were the grandfather and father of WormKill, Hugh Gordon and Keith Dash respectively, and the release of closantel in 1982. Closantel has sustained activity against *Haemonchus*. There were other factors of course.

WHICH WORMKILL?

The figure above/right is what most people remember about WormKill - that or the first version - and the fact that it was so simple and memorable was part of its success. However, supporting advisory material was also developed and in addition there were successive revisions of WormKill. What also escapes attention is that the various iterations of WormKill are built on a foundation of epidemiological principles, and the core of these principles undergird all sheep worm control programs today.

Most commentators do not make it clear to which version of WormKill they refer, but probably it is the initial version (1984) which they have in mind.

An early version (pictured above, figure 2) included grazing management at a time when IPM was not yet a household acronym. Other elements of IPM were added in following years.

Early versions of WormKill may be described as a 'recipes'. Indeed it was a simple, prescriptive expression of the underlying principles. And it worked a treat (more on that later).

However, from the outset, there were variations of WormKill - for different lambing times etc - and the nunciation of various worm control principles - in supporting advisory material. So, a recipe, yes, but not quite as rigid as a cursory examination might suggest.

After a short time, still in WormKill's golden era (~ 1984 - early 1990s, before closantel resistance

took off), other versions of WormKill were developed, reducing the number of closantel treatments from three to two or even one per year on those properties were regular worm egg count monitoring (yes, WECs were advocated) showed that fewer treatments would suffice.

WORMKILL						
Date	Adult sheep & hoggets		Lambs & weaners		Grazing Management	Added fluke control (all sheep)
	Seponver	Broad-spectrum	Seponver	Broad-spectrum		
1st August	◆	◆				
1st November	◆	◆	◆	◆	Move ewes & lambs to low-worm pastures	
1st February	◆		◆	◆	Move lambs to low-worm pastures	
1st April				◆		◆

Figure – KM Dash and others. An early version of WormKill

With closantel resistance on the increase, WormKill was further revised (under the guidance of Marcus Holdsworth, who had taken over from Betty Hall as Veterinary Officer, Armidale), reducing the interval between closantel treatments from 12 weeks to eight.

Alas, such details often go unmentioned, which leads to misconceptions.

‘WORMKILL WAS OK - THERE WAS NOTHING BETTER’

Faint praise is another way that history is re-written and misconceptions are generated.

As to WormKill being OK because there was nothing better (mid 1980s) this is entirely true. In much the same way, a perfectly functional Rolls Royce amidst a junkyard of engineless wrecks would be OK as well.

So, how good was WormKill in its golden years? Well, according to Newman and others it was an outstanding success as an extension program - perhaps never bested in terms of adoption rate - with over 90% of producers in the target area adopting the program in its first year. (Newman RL, 1984).

From 1982 to 1996, I worked as a field veterinarian then as a veterinary pathologist. During this time, I had first hand experience of WormKill and its predecessors in the New England region of NSW. As to efficacy, this program was an outstanding success, particularly against *Haemonchus*. In general the only failures were with respect to *Ostertagia/Trichostronglyus*, and usually because producers had not used effective broad-spectrum drenches, as advised. From 1984 to around 1990, *Haemonchus* -certainly heavy burdens - became a rarity, and was eradicated on some farms. (Barger, I.A., Hall, E. and Dash, K.M., 1991).

Alas, WormKill's very success was also its weakness, and closantel, a cornerstone of the program, became increasingly ineffective in the Northern Tablelands from around 1990 onwards. With the benefit of hindsight, the first versions of WormKill were overkill in some seasons (drier years) and localities (e.g. Moree, Narrabri).

Of course, we cannot live in or return to the past. But the way to doing better in the future is not served well by creating misconceptions about what has gone before.

‘WE DON'T WANT RECIPES: WE WANT SIMPLE AND EFFECTIVE! ‘

I heard this one recently. At first hearing, it sounded good, much like any good slogan.

Alas, worm control is more complicated now because of anthelmintic resistance. And, to date, thorough-going IPM is only used by a small minority of producers.

For an advisor to say they eschew recipes is disingenuous or misguided. Well educated and experienced advisors are well acquainted with the epidemiological principles that are the foundation of current and (sound) worm control. Such advisors do not walk onto a client's farm with a blank mind: they have in mind a template - or 'recipe' if you will - albeit a template that can be modified to fit the client's needs.

DR DASH RESPONDS

“Steve,

I appreciate receiving your messages because it keeps me 'in the loop' so I can connect my time past with the time present. .. [snip] ..

What follows are some comments on the 'old days'. I believe I have stated them accurately, but who knows when you reach 70?

I think many (most?) people have misconstrued what Wormkill was all about. It was never meant to be the last word in worm control, but just the

beginning of an ongoing cooperative program between scientists, field advisory officers and producers. I am delighted that, thanks to you and our many colleagues and producers, it has evolved in just that way.

The central theme of our presentations to producers in 1984 was that the emerging problem we all faced was multiple drug resistance in *Trichostrongylus* (See Webb and others, 1979, Love and others, 1992. – Ed.), and we had to slow down the rate of selection for resistance to give us time to develop alternative control strategies.

At that time the only proven method available to us was to reduce the frequency of treatment with broad-spectrum anthelmintics. However, to achieve this we had to convince producers that we could control *Haemonchus*, which they regarded as the real bogey worm, at the same time. This was where Closantel came in. It was a means to an end.

We always anticipated that Closantel wouldn't last long as an effective anthelmintic, but if we were lucky it would buy us a couple of years to establish our credentials with producers, and gain their confidence, so we could move to more sophisticated control programs.

I think people tend to forget that we were starting from a very low base of credibility because after Thiabendazole was introduced in 1962 we retired from communicating about sheep worm control and abandoned the field to the drug companies. We had to seize the initiative from them, and to do this we had to have a simple message and run very fast so they couldn't catch us and cut us

off at the knees. As a strategy it worked better than we could have hoped: by the time the drug companies woke up to what this small group of Northern Tablelands Nobodies was doing the war was over.

It did of course place enormous stress on our people, as you well remember. By the end of 1984 we were exhausted. Betty Hall's employment had been terminated by the Department of Agriculture, and I remember you and me sitting down in my lounge room and wondering if we could continue. However we survived thanks to the help of some outside parties, including individual producers and local branches of the NSW Farmers' Federation, and a more enlightened approach by the Department of Agriculture in the person of Helen Scott-Orr. CSIRO never really came to the party.

For me personally, Wormkill was a last ditch attempt to bring some relevance to CSIRO research. For years, CSIRO had lost sight of its primary role, defined in the Science & Industry Research Act, which was to undertake research for the benefit of industry and the community. However the organization had no mechanism for translating its research findings into practice, or for supporting the few scientists who tried to do it. Indeed, it was put to me very bluntly that my role in the Wormkill Program was inappropriate for a CSIRO scientist, and to emphasize the point a request from the Queensland Department of Primary Industries for my involvement in introducing the program (as Wormbuster) in that state was refused by CSIRO.

CSIRO's decline into obscurity depresses me, as I am sure it would Hugh Gordon if he were still alive. I am pleased to think of him as the grandfather of Wormkill. One of my treasured possessions is an original edition of Ross & Gordon's (1936) "The Animal Parasites of Sheep", which Hugh inscribed for me "This was a beginning - keep up the good work!”

I am bemused that people tend to think of Wormkill simply in terms of the no-nonsense 1984 program, and judge it on that basis alone. Its principal aim was to re-establish some critical thinking about worm control, and surely after 25 years there can be no doubt that it has done just that.

As the grandfather said, keep up the good work!

Kind regards, Keith.

Postscript:

I don't regard myself as a sage (as you call me) ….. If I had to nominate a sage it would be Tony Lisle, with Ian Barger a close second. I had the great good fortune to work with both of them, and I owe them a great deal. The success of the Wormkill Program was built on Tony's quiet advice about how producers thought and how they would respond.

And I think credit should be given to Helen Scott-Orr, who was responsible for the Department of Agriculture embracing Wormkill and extending the idea to Drenchplan.”

(Dr Scott-Orr in turn gives credit to parasitologist Dr Joe Boray, then Principal Research Scientist with NSW Dept. Agriculture, for encouraging her to promote strategic worm management programs. – Ed.).

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