# Understanding Roundworm Management

ZOLVIX™ PLUS

Elanco™

# Roundworm parasites are a constant threat to New Zealand's pastoral farming industry.

The effects of uncontrolled parasitism on livestock production have been well documented since the first launch of broad spectrum anthelmintics in New Zealand in the 1960's.

Historic estimates are that up to 30% of New Zealand's sheep production is reliant on effective anthelmintics[4]. More recently a study investigating the impact of anthelmintic resistant sheep parasites found that lambs treated every 28 days with an effective drench over a five-month period were worth 14% more than those treated with a less than fully effective drench[3].

In addition, the impact of parasites on other key farm performance indicators is significant. A study involving 500 Romney ewes on a North Island property found significant differences in body weights, lambing percentage and lamb weaning weights in ewes that were kept parasite free compared to those that were not[5].

Cattle production is equally reliant on effective roundworm control. A review of 20 trials measuring production responses in dairy heifers or dairy beef animals to regular drench treatments over the first 12 months, resulted in an average 15 kg live weight advantage, ranging up to 55 kg, while a reduction in mortality of up to 33% was found.[2]

WIthout effective anthelmintics, and thus effective worm control, non – achievement of target weights would force most pasture based dairy farmers to calve heifers as 3-year-olds.[1]

Importantly, this economic model suggested a cost benefit ratio for internal parasite control on NZ dairy farms of 1:27[1].

The impact of roundworms is obvious – for New Zealand farmers to keep their livestock healthy and productive an effective parasite management program is essential.


1. Bisset S.A, "Impact and economic significance of nematode parasitism in dairy cattle in New Zealand" New Zealand Journal of Zoology, 1988, Vol. 15: 327-331. Proceedings of the New Zealand Society for Parasitology (Abstracts of papers presented at the 15th annual conference of the society, University of Auckland, 24-26 August 1987)

2. Brunsdon R.V. & Adam J.L., 1975 (Editors). Internal parasites and animal production. New Zealand Society of Animal Production, Occasional Publication No.4. 53pp.

3. Sutherland, I.A., Bailey, J., Shaw, R.J., 2010. The production costs of anthelmintic resistance in sheep managed within a monthly preventive drench program. Veterinary Parasitology 171, 300–304.

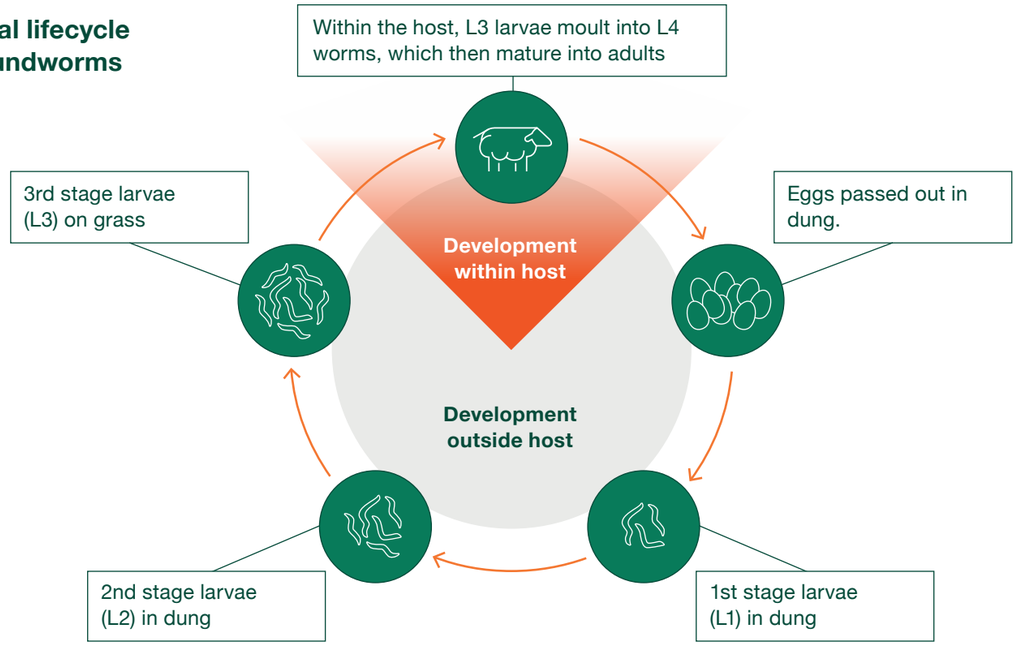
4. Vlassoff A and McKenna P. 1994 "Nematode parasites of economic importance in sheep in New Zealand. New Zealand Journal of Zoology, 21:1, 1-8

5. West D.M., Pomroy W.E., Kenyon, P.R., Morris S.T., Smith S.L., Burnham D.L. "Estimating the cost of subclinical parasitism in grazing ewes". _Small Ruminant Research 86 (2009) 84–86


# Important roundworm parasites

Cattle and sheep roundworm parasites are in the main host specific. This allows cattle to be used to graze and remove sheep parasite infective larvae from pastures and vice-versa. The one exception is *Trichostrongylus axei* which infects both species.

## Typical lifecycle of roundworms




## Common nematode parasites of sheep

| Location | Parasite | Season | Importance |
|---|---|---|---|
| Abomasum | *Haemonchus contortus*<br>Barber's pole worm | Late Summer and Autumn | Major |
| Abomasum | *Teladorsagia (Ostertagia) circumcincta*<br>Small brown stomach worm | Spring and Summer | Major |
| Abomasum | *Trichostrongylus axei*<br>Stomach hair worm | Later summer Autumn | Major |
| Small intestine | *Nematodirus spathiger* and *N. filicollis*<br>Thin necked intestinal worm | Early Spring and Summer | Major |
| Small intestine | *Trichostrongylus colubriformis* and *T. vitrinus*<br>Black scour worm | Later Summer and Autumn | Major |
| Small intestine | *Cooperia curticei*<br>Small intestinal worm | Autumn | Intermediate |
| Large intestine | *Chabertia ovina*<br>Large mouth bowel worm | Variable | Intermediate |

## Common nematode parasites of cattle

| Location | Parasite | Season | Importance |
|---|---|---|---|
| Abomasum | *Ostertagia ostertagi*<br>Small brown stomach worm | Type I Spring and Summer<br>Type II Spring (12 months) | Major |
| Abomasum | *Trichostrongylus axei*<br>Stomach hair worm | Later Summer Autumn | Major |
| Small intestine | *Cooperia punctata* and *C. oncophora*<br>Small intestinal worm | Autumn | Intermediate/major |
| Lungs | *Dictyocaulus viviparus*<br>Lungworm | Spring Summer | Intermediate |

# Anthelmintics (Drenches)

Since the introduction of the first broad spectrum drench class in the 1960's, livestock farmers have relied upon the frequent and possibly indiscriminate use of anthelmintics to control internal parasites in all classes of livestock. A broad-spectrum roundworm drench is one that contains an active ingredient that kills all the important roundworm species.

Benzimidazoles or white drenches were the first class of broad spectrum anthelmintics available, being launched in the 1960's. This was followed by levamisole or clear drenches in the 1970's and macrocyclic lactones or mectins in the 1980's.

Combination drenches containing 2 or more of the broad-spectrum drench families were introduced in the 1990's as a means of slowing the development of resistance to the active ingredients in the combinations and maintaining effective parasite control.

**Introduction of broad spectrum active ingredients over time**

| | | |
|---|---|---|
| **1960** | ✓ **THIABENDAZOLE** | |
| **1965** | ✓ **LEVAMISOLE** | |
| 1968 | PARBENDAZOLE | |
| **1970** | OXIBENDAZOLE | MEBENDAZOLE |
| **1975** | OXFENDAZOLE | FENBENDAZOLE |
| **1980** | ALBENDAZOLE | ✓ **IVERMECTIN** |
| **1985** | | |
| **1990** | | |
| 1994 | DORAMECTIN | ABAMECTIN |
| **1995** | MOXIDECTIN | |
| 1997 | EPRINOMECTIN | |
| **2000** | | |
| **2005** | | |
| 2009 | ✓ **MONEPANTEL** | |
| **2010** | ✓ **DERQUANTEL** | |

Key (Chemical class)

- Benzimidazole (White drench)
- Imidazothiazole (Clear drench)
- Macrocyclic Lactone (Mectin drench)
- Amino-Acetonitrile Derivative (AAD) - Orange drenches
- Spiroindole
- ✓ Major break through

**Subclinical and clinical effects of worm infection**


Adapted from Wormwise Technical Handbook

Unfortunately, roundworms resistant to the older drench actives, including combination products, are now found on many farms across New Zealand.

The cost of drench resistance begins the moment effectiveness begins to decline. The point at which this decline in efficacy becomes economically significant occurs long before visible evidence of drench failure appears.

Rather than using drenches in an ad-hoc or indiscriminate manner, or considering the use of drench to be the sole factor in their roundworm control program, farmers need to consider the long-term sustainability of their parasite management program and include all factors of farm management that impact on parasite management.

Increasingly the strategic use of the novel anthelmintics such as monepantel (available in combination with abamectin in Zolvix Plus), in conjunction with farming practices such as species diversity, stock class policy, pasture management, cropping and nutrition are regarded as essential for the future of livestock farming operations in New Zealand.

# Zolvix Plus™

**Zolvix Plus is a novel combination drench with proven efficacy against important roundworm parasite species of sheep and cattle.**

On farms that have other effective drench options as identified by faecal egg count reduction testing, Zolvix Plus can be used at any point in a worm control program including as an Exit or Knock Out drench.

Exit or Knock Out drenches are strategic doses that are designed to clear out parasites which may have become resistant to other drenches used in a program.

Zolvix Plus is also an integral part of any quarantine process and for use on farms that have identified significant resistance issues, where Zolvix Plus may provide an effective treatment option.

ZOLVIX™ PLUS

# Increasing prevalence of resistance to triple combination drenches in sheep and cattle parasites.

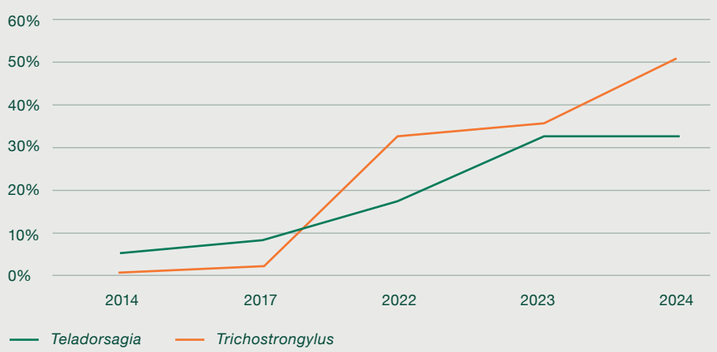
Combination drenches containing mixes of the older active ingredients were introduced to New Zealand farming, firstly as white + clear oral formulations in 1992, followed later by triple (white + clear + mectin) oral formulations in 2002. Mectin + clear pour on and injectable cattle formulations were launched in 2003 and 2011 respectively. These combinations were developed to slow the development of resistance to the active ingredients in the combinations.

Due to widespread use there are now significant levels of resistance to the older combination products with triple drench resistant sheep parasites present on over 33% of New Zealand sheep farms. The predominant genera are the important scour worms, *Trichostrongylus* and *Teladorsagia*.

To slow rising resistance levels and preserve the useful life of the remaining effective drenches, it is important to develop a roundworm parasite control program for individual farms. A cornerstone of any program is conducting a faecal egg count reduction test to determine which drench products are effective on that property.

Once this has been determined a parasite management plan can be developed and should incorporate roundworm epidemiology and other farm management practices including nutrition, cropping, species rotation, stock class rotation and pasture management. Different farming situations will require an individually tailored approach, rather than just deciding which drench to use.

**NZ prevalence of triple drench resistant *Teladorsagia* and *Trichostrongylus* 2014-2024**




Triple drench resistant Ostertagia and Cooperia, have been identified on cattle farms in New Zealand. (6,7,8,9,10)


6. McKenna, P.B. (2016). Update on the prevalence of anthelmintic resistance, Vetscript 28(Nov):56–59.

7 McKenna, P.B. (2018). Update anthelmintic resistance, Vetscript 28(June):44–45

8. Riddy SF. Gribbles Veterinary Update on the prevalence of anthelmintic resistance 2021–2022

9. Riddy SF. Gribbles Veterinary Anthelminthic resistance update 2022-2023

10. Riddy SF. Awanui Veterinary Anthelmintic resistance update 2024


# Elements of Roundworm Management


A sustainable worm control strategy considers three key areas:

1. Host (livestock)
2. Parasite (worms & resistance status)
3. Environment (farm, weather & pasture conditions)

Understanding how each of these elements interact on farm allows an effective long term parasite control programme to be developed.


# Host: Understanding the development of natural worm immunity

The age, health and resilience of livestock affects their ability to handle worm burdens. A strong adult host animal is naturally more resistant to parasites, requiring fewer chemical interventions.

Key factors affecting the host's ability to fight parasites:

**Age & stock class**
Young animals have less developed immune systems and are more vulnerable.

**Health & immunity**
Stronger, well fed, older animals can better suppress worm burdens.

**Pregnancy status**
Ewes and cows in late pregnancy have lower immunity.

**Genetics**
Breeding animals with higher resistance to parasites.

**Drenching history**
Overuse of drenches can weaken natural resistance.

**Biosecurity**
Preventing the introduction of resistant worms through purchased stock.


# Parasite: Managing the worm threat

Understanding the parasite lifecycle is critical to effective control. Worm populations vary based on species, lifecycle, time of year, and exposure to drenches.

Key considerations:

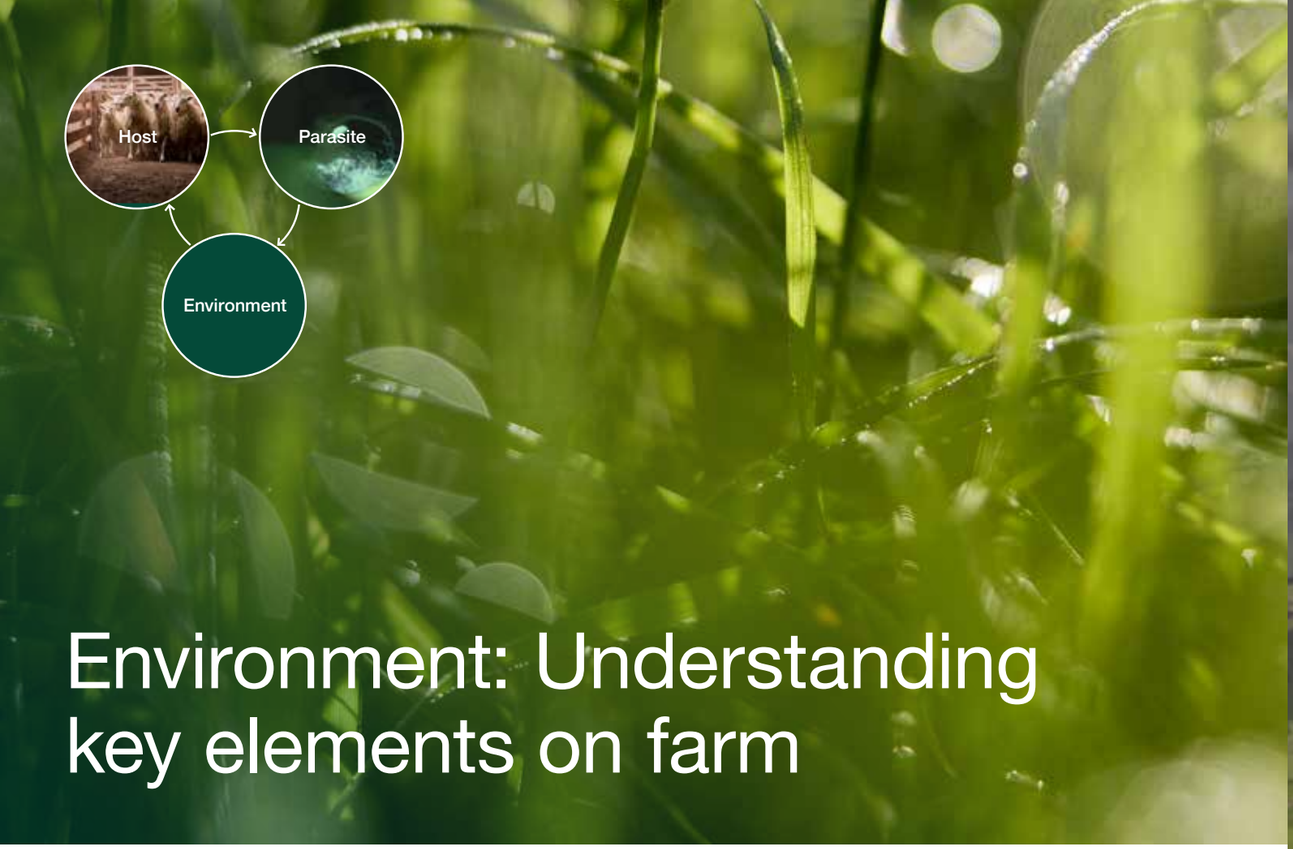
**Worm species**
Different species affect stock in different ways.

**Larval development conditions**
Warm, moist conditions accelerate worm development.

**Drench resistance**
Incorrect or overuse of drench allows resistant worms to establish.

**Worm burden**
High levels of worms mean greater economic losses.

**Larval challenge**
How much exposure stock have to infective larvae.




# Environment: Understanding key elements on farm

Managing the key elements of the farm environment plays a significant role in parasite management. Good pasture management can limit the worm larval challenge to reduce impact on stock and production.

Key environmental factors:

**Pasture type & cover**
Affects the exposure of stock to larvae, e.g. crops.

**Grazing history**
Understanding where the larval challenge is likely the greatest.

**Stocking rate & stock class**
Overgrazing with the same stock class increases larval contamination.

**Weather & topography**
Certain conditions such as a moist, warm environment accelerate larval development.

# Evolving roundworm management

**Managing drench resistant roundworms is a growing challenge, with farmers and vets across New Zealand finding ways to adapt.**

We've gathered experiences from those on the front line of parasite control, to hear from them on how they have responded to roundworm challenges on farm, including those who've faced resistant parasites and managed their way forward.

Sharing successful solutions to the growing challenge in roundworm control helps to educate our industry to secure a successful farming future.

## Michael Cammock

**Location:** Gladstone, 18km southeast of Masterton
**Occupation:** Dry stock sheep and beef farmer

### Implementing change to reduce risk posed by internal parasites to parasite control

Michael has been farming in Gladstone for 13 years, having transitioned from a career in the rural service industry, including roles with Williams and Kettle, PGG Wrightson, Elders, and Ballance Agri-Nutrients. His tenure as a farmer began when his wife's parents were looking to retire, a succession plan was worked out and Michael and his wife have been running the farm ever since.

Michael is a shareholder and supplier for Atkins Ranch, a farmer-led brand supplying premium produce to the likes of Whole Foods in the U.S. His farm runs a self-replacing Romney flock, breeding both replacements and terminal stock. With 4,000 breeding ewes and 1,500 ewe hogget replacements, the goal is to finish all lambs through the Atkins Ranch Group.

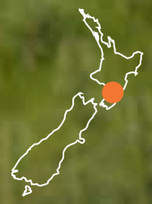
Committed to high-levels of animal welfare and premium farming, his operation is GAP (Global Animal Partnership) certified, ensuring year-round, pasture-raised, grass-fed livestock. Since 2019, the farm has also been part of the Land to Market program, aligning with regenerative agriculture principles.

Michael focused on a proactive and strategic approach to dealing with parasite resistance, seeing it as an inevitable challenge that must be delayed and managed effectively. His focus is on minimising drench use, selecting actives wisely, and incorporating strict quarantine protocols for incoming stock. Testing plays a key role in his decision-making, allowing him to drench only when necessary, rather than following blanket-drenching practices.

"*Obviously it's pretty widely publicised that drench resistance is here and I'm talking more probably triple resistance than anything. It's always on the forefront of our mind, it feels like it's sort of going to be the inevitable in time. So if we can try and delay it somehow or prolong it, that's really first and foremost on our mind. Zolvix Plus is probably one of our main tools to prolong a healthy drench resistance status.*"

Zolvix Plus is a critical tool in his program, used both as a quarantine drench to ensure new stock arrives clean and as an exit drench before winter to reset the farm's parasite status. By integrating good pasture management, alternating grazing species, and ongoing monitoring, he has built a system that prioritises a long-term sustainable operation and profitability.

## Mark Guscott



**Location:** Martinborough, Wairarapa
**Occupation:** Sheep and beef farmer, diversified business owner
**Farm Type:** Mixed farming – lamb, cattle, breeding stock, arable, and tourism while maintaining high animal welfare standards in a premium supply chain.

For over 20 years, Mark and his wife Susannah have run their sixth-generation family farm in the Wairarapa, supplying high-value product to the likes of Atkins Ranch. Their 1400-hectare operation balances breeding stock, finishing lambs and cattle, and arable farming, while also leveraging tourism as a profitable side business.

Collaboration is central to their success, they work with trusted suppliers to maintain high levels of animal welfare and farm quality assurance standards, earning premium prices for their stock. By sourcing animals of known origin, they also reduce importing "bad" parasites and improve biosecurity, reinforcing their long-term, sustainable approach to farming.

After realising their drenching routine was failing, Mark took decisive action—overhauling their entire farm system to break the cycle of increasing parasite resistance. Moving away from ineffective drenches, they diversified their business, introduced crop rotations and increased cattle numbers, and started strategic parasite monitoring using faecal egg counts.

"*You know, I'm a lot of things, but I'm not a quitter. So we just got into a whole change mode and turned the whole farm system upside down. Got a broom out essentially and just changed a whole lot because the whole system wasn't working.*"

By eliminating unnecessary drenching and sourcing stock from trusted suppliers, they've delayed further resistant parasite development while improving productivity. Now, with strict testing, tailored drenching cycles, and high-protein feed strategies, they're staying ahead of drench resistance, proving that success comes from implementing change in farm management strategies, not just drenching.

Their team's on-the-ground insights and commitment to continuous learning ensure they remain agile in the face of evolving challenges, always aiming for excellence, not perfection.

For Mark, successful livestock parasite management isn't just about numbers, it's about observation, intuition, and adapting to what's in front of you. In Mark's view, farming is about adaptation, not repetition. Every season is different, and rigid systems won't work in an environment that constantly shifts.

"*I don't think you can farm if you want to stick with that whole 'we're going to do the same thing every year.' It just doesn't work.*"

Trusting the team's instincts, questioning what's happening in the paddock, and being willing to adapt when conditions change has been crucial. They rely on regular testing, learning from others, and working with experts to refine their approach—knowing that good nutrition and better farming practices can reduce reliance on drenches.

## Kate & Scott Burgess

**Location:** Waipahi South Otago
**Occupation:** Dairy Farmers - Dairy
(Former sheep farm, converted six years ago)
**Years in Industry:** Legacy farmers, with experience in agribusiness and animal health

### Zolvix Plus: Setting up the next generation for success. Scott & Kate's proactive approach to parasite control

Scott and Kate are in the process of taking over ownership of their family farm, navigating the complexities of roundworm parasite resistance along the way. Coming from both farming and agribusiness backgrounds, they've seen how limited testing and misinformation can lead to poor drenching practices in their region. With reluctance to making changes a prevailing attitude among many farmers, they believe that effective communication and education are key to tackling drench resistance before it becomes an even bigger issue.

For Scott and Kate, quarantine drenching with Zolvix Plus is non-negotiable when bringing new stock onto their farm. While they haven't yet introduced faecal egg counting, they recognise its importance and plan to integrate it into their management plan. Their approach is simple: start stock clean, keep them growing fast, and protect farm productivity, and they believe that good parasite control is just as critical as nutrition when it comes to hitting target live weights at first mating, and if stock don't reach those targets, their lifetime production is compromised, impacting farm profitability.

*"For us, it's like having a big clean out. And you know that it's going to work because of the product. We know that they're coming in with a full clean out of worms, starting fresh. So it kind of feels like we're giving them the best possible start to grow."*

While Kate and Scott acknowledge that the cost of Zolvix Plus can be a barrier they see it as an investment, not an expense, one that prevents long-term reliance on ineffective drenches. They acknowledge that best practice varies farm to farm and stress the importance of working closely with animal health experts to build an effective, tailored parasite management plan.

They also see education as key. Through self-led monthly training sessions with their team, they ensure that knowledge is shared, setting up the next generation for success. Their biggest concern? What farming will look like if anthelmintic resistance gets out of hand. Without action now, the ability to fatten stock and run profitable operations will become a much bigger challenge for the future.

## Rob O'Sullivan

**Location:** Glasgow Station, Gisborne
**Occupation:** Sheep and Beef station manager
**Farm Type:** Hill Country – Sheep & Beef

Triple drench resistance was not something Rob O'Sullivan expected to deal with so suddenly. One season, everything seemed fine. The next, lambs weren't responding to drenching, weight gains stalled, and triple resistance was diagnosed through testing.

Like many in the region, he had heard about resistance but assumed it was mostly an issue for trading farms, until it came to a head, and hit what seemed like everyone in the region all at once. Weaning weights dropped, lamb growth slowed, and farmers saw increasing clinical failure of their drenches. Capsules, Rob's farm's historically favoured treatment, stopped working entirely, and faced with this challenge, the only option was to reassess the system and adapt.

The first step was cutting sheep numbers and increasing cattle to reduce parasite pressure. Testing became a core part of management, ensuring drenches were only used when necessary.

*"Every drench, we test everything and monitor everything, and going forward into lambing monitoring ewes and doing a lot of faecal egg counts. That's the big one for us, keeping an eye on things because in the past where you'd just treat them every 28 days or whatever, sometimes they don't need to be drenched every 28 days and you're just adding fuel to the fire really by pouring it down their throat. But now we're monitoring a lot more and just using that advice we get from the vets and all that comes back with it. When you do those tests, they always give you advice on whether to go or not or what to use. Then the other big one is Zolvix Plus."*

Prior to being diagnosed triple drench resistant, Zolvix Plus was used on the station primarily as an exit drench, while it is now being implemented more strategically, including at weaning for a complete clean-out before rotating back to triple drenches.

Through careful monitoring, collaboration with vets, and a willingness to adjust stock ratios, the farm is managing the challenge, while a shift in mindset, and a willingness to listen and learn from others in the same boat have been critical to keeping productivity on track.

*"There's a way through it. You've just got to change as you change your system a bit and get advice. Talk to the vets, they know all about it, as much as can be known about it, and see what other farmers are doing, is probably the biggest one. Just talk to people, and be prepared to change. You've got to do things differently, we can't just carry on ignoring it and doing things the same because it won't work at all, we'll start going backwards and we don't want that. We want to be able to farm for many generations to come."*

# Brent Neal

**Location: North Waikato**
**Occupation: Veterinarian**
**Farm Type Expertise: Sheep, Beef, and Dairy**
**Years in Industry: 24+ years**

Brent has seen firsthand the growing impact of drench resistant parasites across different farming systems. With experience in New Zealand, Australia, and the UK, he understands that anthelmintic resistance is not just a local issue but a global challenge. Through his work as a large animal vet he focuses on helping farmers implement effective, sustainable parasite management strategies to protect productivity and prolong the efficacy of drenches.

Dr Brent Neal has seen drench resistance accelerate at an alarming rate, with clinical drench failure now a reality for increasing numbers of farmers. What was once a rare occurrence has become common, forcing farmers to rethink their approach to roundworm control.

Brent has worked with farmers who faced clinical parasitism—where drenches simply stopped working, stock health declined, and productivity declined. By incorporating all the tools available including testing, and making strategic management changes, these farmers recovered control of their parasite situation.

One client, after having triple drench resistance diagnosed, was on the verge of selling his farm. Instead, Brent advised changes to his roundworm control system—using older cattle to "vacuum" worm-laden pastures, adjusting grazing rotations, and making drenching decisions based on testing, not habit. Nine months later, his business was stronger than ever—with healthier young stock and significantly reduced drench use.

Zolvix Plus is a lifeline in cases of clinical drench failure, but it must be used wisely. Brent warns against relying on Zolvix Plus as a routine fix, comparing this approach to "throwing it around like a bottle of Sprite at a party." Instead, he emphasises the importance of using the right drench, at the right time, based on data—not guesswork—keeping it effective for the long haul.

"*We don't want to totally petrify people—this isn't the end of the world. The sky isn't falling. There are ways we can work around this. But farmers need to take ownership now before the choices disappear.*"

Brent Neal's advice is simple: don't wait for the perfect plan—take action now. Farmers should talk to someone who understands their system, because even small, smart changes can have a big impact on slowing resistance.

In his view, a farmer's approach to parasite management doesn't have to be perfect, but a willingness to face the problem, and seeking out good information is always better than nothing. The key is to engage, ask questions, and make informed decisions rather than relying on habit.

"*You might not be able to do things perfectly all the time, but if you can be good all the time—that's already better than what most are doing now.*"

Brent is clear that there's no silver bullet, but by feeding stock well, managing pastures smartly, and drenching effectively only when needed, farmers can take control of the problem—before it takes control of them.

# Zolvix Plus for Sheep and Cattle

**KEEP OUT OF REACH OF CHILDREN**
**FOR ANIMAL TREATMENT ONLY**
**ZOLVIX™ PLUS for Sheep and Cattle**
**ACTIVE CONSTITUENTS: 25 mg/mL Monepantel and 2 mg/mL Abamectin**

Monepantel is a member of the class of anthelmintics called the Amino-Acetonitrile Derivatives (AADs) while Abamectin is a member of the Macrocyclic Lactone (ML) class of anthelmintics.

ZOLVIX PLUS for Sheep and Cattle is effective for the treatment and control of sensitive strains of nematodes (roundworms), including nematodes that have single, dual or triple resistance to macrocyclic lactones (including moxidectin resistant strains), benzimidazoles (white drenches), imidazothiazoles (levamisole, clear drench) in sheep, beef cattle and non-lactating dairy cattle and morantel (clear drench) and salicylanilide (e.g. closantel)-resistant strains, in sheep. ZOLVIX PLUS for Sheep and Cattle is also effective against AAD-sensitive immature (L4) stages of *Haemonchus contortus* and *Teladorsagia circumcincta* in sheep where a combination of a macrocyclic lactone and derquantel is less effective.

**DIRECTIONS FOR USE**
**The product is NOT TO BE USED in sheep less than 15 kg of bodyweight or 3 months of age.**
**The product is NOT TO BE USED in cattle less than 100 kg of bodyweight or 16 weeks of age.**

**SAFETY TO SHEEP AND CATTLE**
ZOLVIX PLUS for Sheep and Cattle has a wide margin of safety when used as recommended and is readily accepted by sheep and cattle.

**DOSAGE AND ADMINISTRATION**
ZOLVIX PLUS for Sheep and Cattle is a ready-to-use oral solution.

A representative sample of animals should be weighed before treatment. Dose the animals to the heaviest live weight in each group. DO NOT under dose. Where there is a large variation in weight within the group, dose should be based on the label directions for each weight range. Drafting into two or more lines may be appropriate, to avoid excessive overdosing. A correct drenching technique is recommended; carefully place the drench gun nozzle in the side of the mouth and over the back of the tongue before delivering the dose.

Check dose and drench gun before treatment commences. Drench animals orally using an Elanco recommended drench gun. Maintain applicator gun carefully to ensure accurate dosage. After use, clean gun by flushing with warm, soapy water. Rinse with cold water.

Resistance may develop to any chemical.

**SHEEP**
The dose for sheep and lambs is 0.5 mL/5 kg (1 mL/10 kg), equivalent to 2.5 mg monepantel/kg and 0.2 mg abamectin/kg body weight.

| | | Number of Animals treated per: | | |
|---|---|---|---|---|
| Body weight (kg) | Dose (mL) | 1 L | 2.5 L | 5 L |
| 15-20 | 2.0 | 500 | 1250 | 2500 |
| 21-25 | 2.5 | 400 | 1000 | 2000 |
| 26-30 | 3.0 | 333 | 833 | 1666 |
| 31-35 | 3.5 | 285 | 714 | 1428 |
| 36-40 | 4.0 | 250 | 625 | 1250 |
| 41-50 | 5.0 | 200 | 500 | 1000 |
| 51-60 | 6.0 | 166 | 416 | 833 |
| 61-70 | 7.0 | 142 | 357 | 714 |
| 71-80 | 8.0 | 125 | 312 | 625 |

Sheep in excess of 80 kg body weight should be dosed at 1 mL/10 kg.

**CATTLE**
The dose for cattle is 5 mL/50 kg (1 mL/10 kg) (equivalent to 2.5 mg monepantel/kg and 0.2 mg abamectin/kg body weight).

| | | Number of Animals treated per: | | |
|---|---|---|---|---|
| Body weight (kg) | Dose (mL) | 1 L | 2.5 L | 5 L |
| 100 | 10 | 100 | 250 | 500 |
| 101-120 | 12 | 83 | 208 | 416 |
| 121-150 | 15 | 66 | 166 | 333 |
| 151-200 | 20 | 50 | 125 | 250 |
| 201-250 | 25 | 40 | 100 | 200 |
| 251-300 | 30 | 33 | 83 | 166 |
| 301-350 | 35 | 28 | 71 | 142 |
| 351-400 | 40 | 25 | 62 | 125 |
| 401-450 | 45 | 22 | 55 | 111 |
| 451-500 | 50 | 20 | 50 | 100 |
| 501-550 | 55 | 18 | 45 | 90 |
| 551-600 | 60 | 16 | 41 | 83 |
| 601-650 | 65 | 15 | 38 | 76 |

Cattle in excess of 650 kg body weight should be dosed at 5 mL/50 kg.



**WITHHOLDING PERIODS**

**MEAT (SHEEP): Sheep producing meat or offal for human consumption must not be sold for slaughter either during treatment or within 14 days of the last treatment.**

**MEAT (CATTLE): Cattle producing meat or offal for human consumption must not be sold for slaughter either during treatment or within 19 days of the last treatment.**

**MILK (SHEEP): Milk intended for sale for human consumption must be discarded during treatment and for not less than 35 days following the last treatment.**

**MILK (CATTLE): Milk intended for sale for human consumption must be discarded during treatment and for not less than 49 days following the last treatment. If calving occurs within 7 weeks of the last treatment, milk must not be processed for human consumption until 7 weeks following last treatment has passed.**

**By law the user must take due care, obtaining expert advice when necessary, to avoid unnecessary pain and distress when using the product other than as directed on the label.**

For more information please refer to the product label.