

— 2023 —

PARASITE MANAGEMENT CALENDAR



wormwise
national worm management strategy



This calendar is designed to be an educational tool to provide information on:

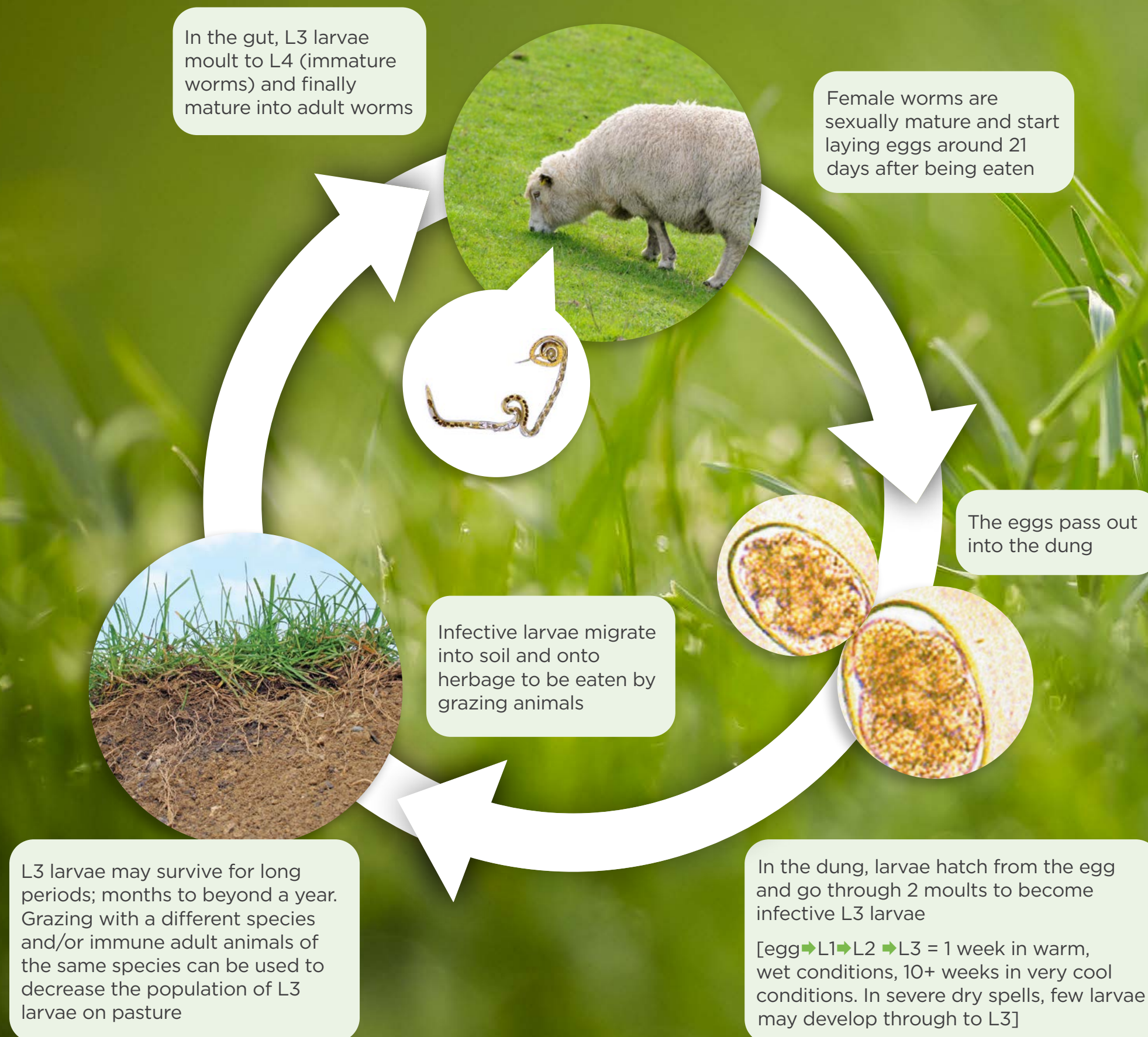
- Internal parasite biology.
- The main parasites of concern in New Zealand and what animals they affect.
- Parasite management tools available for your farm.
- Tools for monitoring in relation to parasite management.
- Risk factors for drench resistance.
- Prompts on what to consider for each month.
 - Note, due to the variation of farm systems and environments around New Zealand, these prompts are a guide and not hard dates on when to carry out certain jobs.

Thank you to our farmers for generously providing us with amazing images and our Farmer Reference Advisory Group for reviewing this calendar.

Glossary of terms

Term	Definition
Advisor	An animal health advisor experienced in livestock parasite management.
Anthelmintic(s)	A chemical(s) capable of killing parasitic worms – commonly called drench.
BCS	Body Condition Score – find out more here by going to the B+LNZ knowledge hub and searching ‘BCS’.
Clean pasture	A paddock assumed to have very few or no worms on it (e.g. a newly sown paddock). Also known as a ‘clean paddock’.
eBV	Estimated breeding value. A measure of genetic merit for a particular trait (whether directly measurable or not), estimated from performance, pedigree and/or from DNA tests.
FEC	Faecal Egg Count, also known as egg count. Measures the number of worm eggs in a faecal sample. This test does not tell you what types of worms are present.
FECRT	Faecal Egg Count Reduction Test. Used to find out which drench families are effective on your farm. It takes some planning to run this test. Groups of animals will be drenched with different drenches you want to test (e.g. individual families like ML’s, as well as combination drenches containing multiple families of drench). Samples for FEC and larval culture will be taken before and after drenching each group of animals.
Knockout drench	Substitution of a routine drench with a highly effective product is used prior to optimal larval survival and development conditions.
Mectin/ML	One of the families of drench. The active ingredients in this family include Moxidectin, Ivermectin and Abamectin.
Novel active	The newest families of drench, monepantel and derquantel. Products on the market containing these actives are: Startect® - A combination drench containing the novel active derquantel as well as the active abamectin, and Zolvix™ - A combination drench containing the novel active monepantel as well as the active abamectin.
Payout period	The length of time the drench or treatment works to kill worms in the animal after drenching/treating.
Quarantine protocol	A process to minimise new stock bringing resistant worms with them onto your property. This protocol includes drenching with a novel active, holding animals off pasture for at least 24 hours, then moving animals to contaminated pasture.
Refugia	Refugia is leaving some worms ‘in refuge’ or free from drench to maintain worm populations on your farm that are susceptible to drench.
Targeted Selective Treatment	A system that selects animals on an individual basis for drenching using certain criteria, e.g. egg counts.

The lifecycle of internal parasites



January 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
26	27	28	29	30	31	1
				New Year's Eve	New Year's Day	
2	3	4	5	6	7	8
Day after New Year's Day	New Year's Day (observed)					
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
Wellington Anniversary Day						
30	31	1 Feb	2	3	4	5
Auckland, Nelson, Northland Anniversary Day						

THINGS TO THINK ABOUT THIS MONTH



Sheep

Do you need to drench and when?

Do a FEC test on:

- Lambs 28 days post drench to check for re-infection. Typically, lambs on contaminated pasture are drenched every 28 days, lambs on cleaner pasture may not need to be.
- Lambs on summer crops: they should not need drenching every 28 days BUT monitor so you don't get caught out!
- Ewe hoggets that have reared a lamb.

Is your lamb drench working?

- Drench check on 10 individual lambs.

Are eggs present and if so, what type of worms are they?

- Request larval cultures – check for Barbers Pole Worm.

Are your ewes at > BCS 3?

- Plan to get your weaned ewes and ewe hoggets that have reared a lamb to > BCS 3.

Protect your susceptible worms by using refugia

- Share lamb grazing areas with undrenched ewes.
- Consider leaving some lambs untreated after seeking advice.

Consider your grazing management

- Lambs grow faster on low worm contamination feed.
 - Regular drenching will not reduce the effects of a daily worm challenge.

Cattle

Do you need to drench and when?

Do a FEC test on:

- Calves 28 days post drench to check for re-infection.

Is your calf drench working?

- Drench check on 10 individual calves.

Consider your grazing management

- To reduce worm challenge, try to graze young calves on low worm contamination feed and/or share grazing area with adult cattle or sheep.

Postmortem of tail-end ewes

Less than 20% of tail-end ewes are light because of parasitism.

Get post-mortems done by your vet to understand the underlying factors on your farm.

You may be treating ewes that are sick with something else.

Faecal egg count (FEC)

Measures the egg output of the adult female worm population in the gut of the animal sampled.

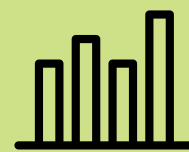
Use as a tool to identify issues early, what animals need drenching, and highlight areas of the farm where animals are under greater or lesser worm challenge.

Faecal egg count reduction test (FECRT)

Used to identify which drench families are effective. Test every 2-3 years - usually, in January/February.

Sheep: test a range of drenches at once.

Cattle: may be easier to test 1 or 2 actives at a time.



MONITORING FOR PARASITE MANAGEMENT

If you don't measure, you can't manage.

Larval culture

Worm species vary in their impact on your animals.

Different drenches can be more effective for certain species of worms.

Know your worm species to help with your parasite management plan.

Body condition scoring and live weight gain

Weight loss and loss of condition can be a sign of parasitism.

Use these measures to gauge how your stock are performing.

Drench check

Check your drench has worked by doing a FEC 10-12 days after drenching.

This should be done at least twice a year.

February 2023



THINGS TO THINK ABOUT THIS MONTH



Mon	Tue	Wed	Thu	Fri	Sat	Sun
30 Auckland, Nelson, Northland Anniversary Day	31	1	2	3	4	5
6 Waitangi Day	7	8	9	10	11	12
13	14 Valentine's Day	15	16	17	18	19
20	21	22	23	24	25	26
27	28	1 Mar	2	3	4	5
6	7	8	9	10	11	12

Sheep

Do you need to drench and when?

Do a FEC test on:

- Lambs 28 days post drench to check for re-infection. Lambs on contaminated pasture typically need drenching every 28 days, lambs on cleaner pasture may not.
- Lambs on summer crops should not need drenching every 28 days BUT monitor so you don't get caught out!
- Mixed aged ewes (light and main mobs) and 2-tooth ewes pre-tup.

Are eggs present and if so, what type of worms are they?

- Request larval cultures to check for Barbers Pole Worm.

Use refugia to protect your susceptible worms

- Share lamb grazing areas with undrenched ewes.
- Consider leaving some lambs untreated after seeking advice.

Consider your grazing management

- Grow lambs faster by providing feed with low worm contamination.
 - Regular drenching will not reduce the effects of a daily worm challenge.
- Make a feeding and management plan for ewes to have them at BCS ≥ 3 at lambing, and enough grass to set stock multiples onto pasture covers of 1,400 kgDM/ha.

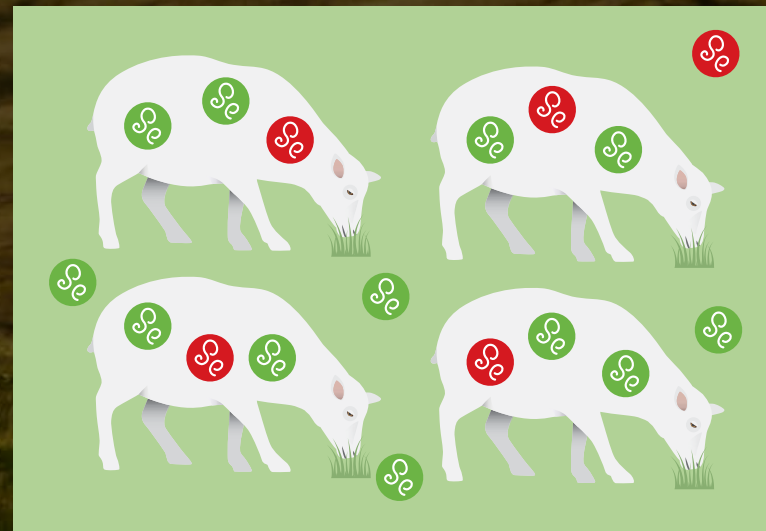
Cattle

Use refugia to protect your susceptible worms

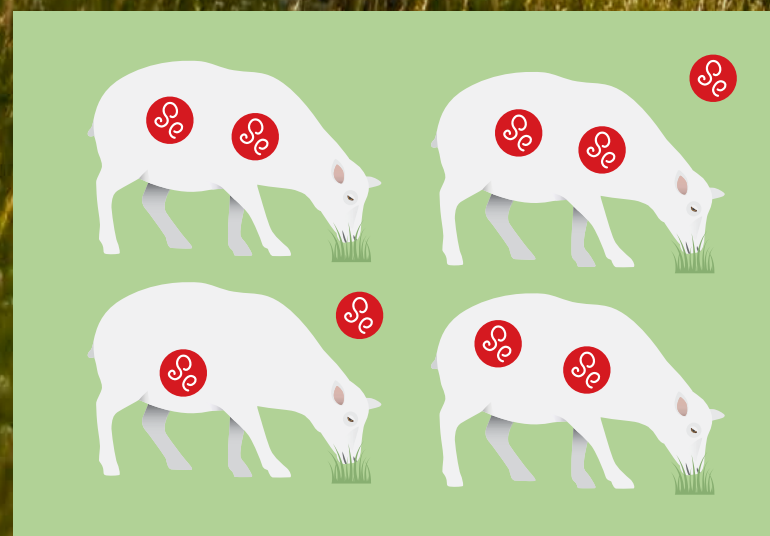
- Share dairy-beef calf grazing areas with adult cattle or sheep.

Refugia

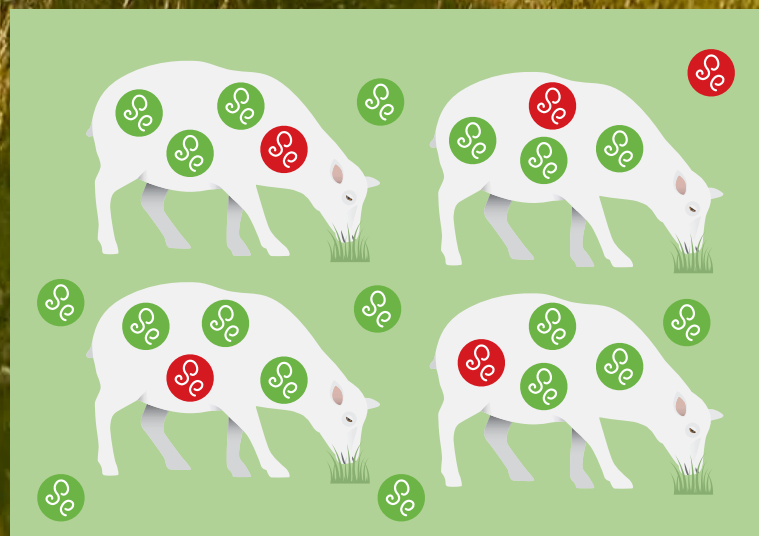
Maintaining worm populations on your farm that are susceptible to drench.





Without refugia



✓ With refugia



 Susceptible parasites  Resistant parasites

WAYS TO INTRODUCE REFUGIA ON YOUR FARM



- Leave some stock undrenched - for young stock, make sure this is safe to do so.
- Leave older animals undrenched unless there is a demonstrated need.
- Put undrenched older animals on pasture previously grazed by drenched young stock.
- When drenching, return animals to the same infected pasture before going onto 'clean' pasture.
- Draft out tail-end 2-tooth ewes and graze these with undrenched lambs.
- Keep drench intervals at 28 days or more.



March 2023



THINGS TO THINK ABOUT THIS MONTH



Mon	Tue	Wed	Thu	Fri	Sat	Sun
27	28	1	2	3	4	5
6	7	8	9	10	11	12
13 Taranaki Anniversary Day	14	15	16	17	18	19
20 Otago Anniversary Day (observed)	21	22	23	24	25	26
27	28	29	30	31 April Fools' Day	1 Apr Daylight Savings Time ends	2
3	4	5	6 Good Friday	7	8	9 Easter Sunday

Sheep

For brought-in trade lambs, use a quarantine protocol to minimise resistant worms coming onto your farm

- Drench with a combination of 4 unrelated actives, one containing monepantel (in ZolvixTM) or derquantel (in Startect[®]).
- Keep lambs off pasture for at least 24 hours. Eggs from resistant worms will pass onto the ground preventing further growth.
- After the 24-hour quarantine period, move your lambs to contaminated pasture (not 'clean pasture') to reduce the risk of drench resistance.

Consider your grazing management

- To ensure the percent of light ewes is minimised and feed levels are optimal, do your feed budget.

Cattle

Use refugia to protect your susceptible worms

- Consider targeted selective treatment for dairy-beef calves as they get bigger and more robust.
 - Leaving the best-performing calves untreated for one drench can help maintain refugia in their grazing area.
 - Use individual ID's and carefully monitor visually.

Considerations for drenching

- Ideally, drench beef calves with an oral combination drench at weaning as opposed to an injection or pour-on.

“Genetics are like compound interest. If you buy a ram today, his genes are going to be influencing your profit for the next 10 years.”

Robert Peacock, Orari Gorge Station

Genetic selection for ‘resistance’ or ‘resilience’

- **Resistant** animals can reduce or eliminate a population of worms in their gut.
- **Resilient** animals do not eliminate the worms, but can deal with them without showing reductions in productivity.

Highly resistant sheep may be slightly less productive – this can be addressed by selecting sheep with increased productivity eBVs and low FEC eBVs.

An increasing number of breeders are recording DAG SCORE and selecting for animals with low dags.

If you want to find out more, visit www.sil.co.nz



April 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
27	28	29	30	31	1	2
				April Fools' Day	Daylight Savings Time ends	
3	4	5	6	7	8	9
			Good Friday		Easter Sunday	
10	11	12	13	14	15	16
Easter Monday	Southland Anniversary Day					
17	18	19	20	21	22	23
24	25	26	27	28	29	30
	Anzac Day					
1 May	2	3	4	5	6	7
				Coronation of King Charles III		

THINGS TO THINK ABOUT THIS MONTH



Sheep

Consider a 'Knockout' drench for lambs

- At the 4th to 5th drench, a 'knockout' drench can be used to remove worms that have survived routine combination drenches. The 'knockout' drench must contain a novel active (Monepantel (in Zolvix™) or Derquantel (in Startect®)).

Consider your grazing management

- To ensure the percent of light ewes is minimised and feed levels are optimal, do your feed budget.



Cattle

Is your calf weaning drench working?

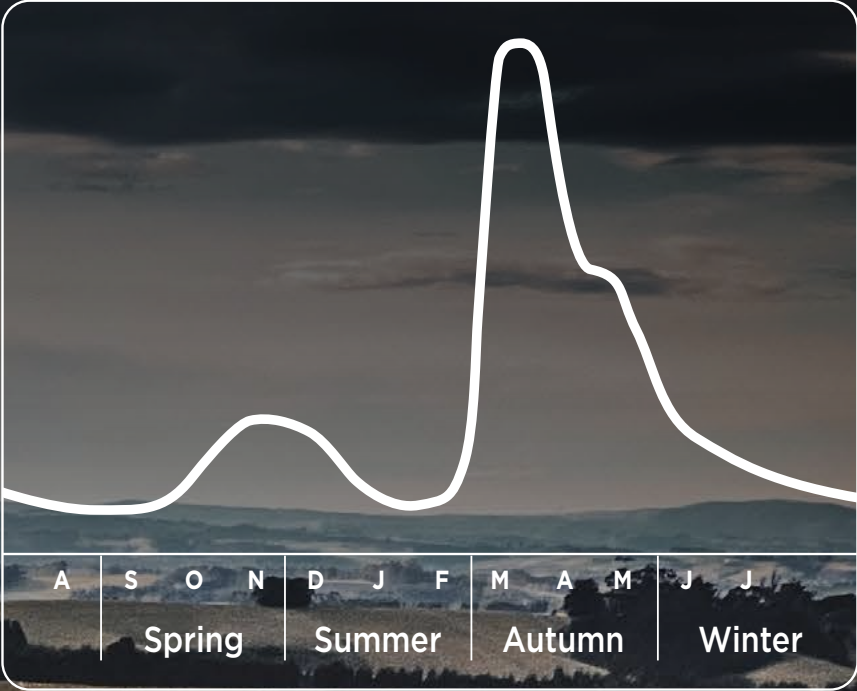
- Drench check 10 individual beef calves.

Considerations for drenching

- Ideally, drench beef calves with an oral combination drench at weaning as opposed to an injection or pour-on.

“In terms of drench use, we had a change of mindset so rather than carrying extra lambs through the autumn to the stronger market, in the winter we made sure every lamb on the farm was growing and on good feed covers, not picking up as much larvae.”

Mike Cranstone, sheep and beef farmer, Wanganui



Generalised seasonal pattern of infective larvae on the pasture arising from untreated livestock

May 2023



THINGS TO THINK ABOUT THIS MONTH



Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1 June	2	3	4
5	6	7	8	9	10	11
King's Birthday						

Sheep

Do you need to drench and when?

Do a FEC test on:

- Light ewes at ram removal.
- Trade lambs and ewe replacements 28 days post drench to check for re-infection.
 - Strict drench intervals may not be needed over winter as worm immunity is developing BUT keep monitoring!

Consider your grazing management

- To ensure the percent of light ewes is minimised and feed levels are optimal, do your feed budget.

If killing tail-end ewes for dogs, check ewe livers for fluke.

Cattle

Considerations for drenching

A drench pre-winter may benefit:

- R2 cattle and light beef cows that are behind target for autumn liveweight gain.
- Cows that have weaned in poor condition and are not gaining weight.
 - Parasites are not the only cause of reduced liveweight gain, seek advice.
- Use a product containing a 'mectin'/ML if drenching R2 cattle or light beef cows.

“We don’t drench ewes,
we don’t need to, just a
handful of light ones
from the pressure of
mob-stocking.”

Hamish Blundell, sheep and beef farmer, North Wairarapa



***Cooperia* species**

Different species affect sheep and cattle.

- Cattle
 - Can be a significant worm problem in intensive cattle farming systems.
- Sheep
 - Have minimal production impact but can be a significant part of winter worm burden in ewes.

June 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
29	30	31	1	2	3	4
5	6	7	8	9	10	11
King's Birthday						
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	1 Jul	2
3	4	5	6	7	8	9

THINGS TO THINK ABOUT THIS MONTH



Do you need to drench and when?
Do a FEC test on:

- Ewes prior to scanning.
- Early lambers prior to pre-lamb vaccinations.

Consider your grazing management

- Take out ewes < BCS 3 and preferentially feed.
- Separate triplets at scanning to prevent weight loss in the last trimester.



Consider your grazing management

- Ensure all cattle on winter crops are being fed adequately. Insufficient intake is the biggest cause of poor performance on crops.

Considerations for drenching

- Drench R1 cattle prior to going onto winter crop.
- R2 cattle that have been performing below average may benefit from a drench prior to going onto winter crop.
 - Parasites are not the only cause of reduced liveweight gain, seek advice.



High risk factors for increasing drench resistance

Activity	Management
Using long-acting products pre-lambing	Long-term: Look to best-practice feeding and ewe body condition to eliminate need for these products. Short-term: Identify individuals within each mob that can most safely be left untreated, to provide refugia. Try to avoid weaning lambs back onto areas grazed by treated ewes.
Preventative lamb drenching from weaning (low – high risk)	Consider the interval between drenches – 28 days should be the minimum. While drenching lambs on demand based on FEC is likely to reduce selection for drench resistance, careful monitoring needs to be performed to achieve this successfully. It is much easier to do on 'clean' feed (see below).
Drenching onto 'low contamination' pasture	Drenching sheep onto 'clean' feed like newly sown pasture, can strongly select for drench resistance. Leave a small proportion of the heaviest lambs undrenched, use undrenched older sheep as leaders or followers, or drench a few days before the lambs go onto 'clean' pasture.
Buying stock with resistant worms	Follow a strict quarantine protocol for incoming stock including holding them off pasture for 24 hours after an effective treatment. Double and triple combinations are not effective quarantine drenches. Alternatively, buy stock from farms able to document a low drench resistance status to avoid the need for this protocol.
Continued use of ineffective product	Use regular drench checks and FECRT to determine drench efficacy on farm.



July 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1 Aug	2	3	4	5	6

THINGS TO THINK ABOUT THIS MONTH



- Do you need to drench and when?**
Do a FEC test on:
- Ewes prior to scanning
 - Hoggets
- Consider your grazing management**
- Separate triplets and preferentially feed so they don't lose weight in the last trimester.
 - At ram removal/scanning take out ewes < BCS 3 and preferentially feed.



Moderate risk factors for increasing drench resistance

Activity	Management
Ewe drenching at docking/ tailing	In NZ, ewes usually gain immunity to worms by docking/tailing time. Not drenching will ensure both resistant and susceptible eggs are deposited onto pasture and should not result in production losses if animals are well-fed.
Ewe drenching at other times	Do you actually need to drench ewes? Or can other management practices improve ewe performance? Assess the 3 F's: FECs, Feed, and Fatness and consider treating only part of a flock based on risk (e.g. pregnancy rank, age or condition score). 2-tooth ewes can be more prone to parasitism and may need to be considered separately.



August 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	25	27
28	29	30	31	1 Sep	2	3
					Father's Day	
4	5	6	7	8	9	10

THINGS TO THINK ABOUT THIS MONTH



Sheep

Do you need to drench and when?

Do a FEC test on:

- Ewes prior to lambing.

Are your ewes > BCS 3?

- Monitor ewes pre-lamb. If they are <BCS 3, separate them, give them more feed and lower their stocking density.

Consider your grazing management

- Reduce the risk of drench resistance by minimising the need for long-acting treatment in ewes through nutrition.
 - Provide great nutrition pre-lamb and early lactation by set-stocking onto target covers of 1400+kgDM/ha.



Cattle

Considerations for drenching

- It is often not necessary to drench R2 cattle. However, parasites can still be a cause of poor performance in R2 cattle.
- A spring drench in R1 cattle that have the best live weight gain may not be required.
- Use a product containing a 'mectin'/ML if drenching R1 or R2 cattle to target *Ostertagia*.

“Ineffective drenching costs money in lost production and time.”

Andrew Dowling, Technical Expert -
Animal Health & Nutrition, PGGW



Ostertagia (Teladorsagia) circumcincta

- Affects sheep.
- Most dominant in late winter and early spring.
- Long-acting treatment of ewes is a risk factor for increasing resistance in this species.
- Relatively harmful but small component of the worm burden.



Ostertagia ostertagi

- Affects cattle
- Two types:
 - Type I ostertagiasis: causes scouring and weight loss like other worm infestations in calves.
 - Type II ostertagiasis: can cause sudden and severe illness and even sudden death in animals 9-12 months or older but is relatively rare.

September 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1 Oct
2	3	4	5	6	7	8

THINGS TO THINK ABOUT THIS MONTH



Sheep

Do you need to drench and when?

Do a FEC test on:

- Ewes prior to lambing.

Considerations for drenching at docking/tailing?

- To reduce the risk of drench resistance avoid whole-flock docking/tailing drench as an annual policy.
- A ewe drench at docking/tailing is unlikely to give a positive production response.

Consider your grazing management

- Reduce the risk of drench resistance by minimising the need for long-acting treatment in ewes through nutrition.
 - Provide great nutrition pre-lamb and early lactation by set-stocking onto target covers of 1400+kgDM/ha.
- Monitor pasture covers to ensure sufficient feed for ewes over lambing through to docking/tailing. Plan for options to increase feed to mobs if needed.



***Trichostrongylus* species
(Trichs)**

Three common species

- One affects sheep and cattle and two affect sheep only.

Main danger period is **winter**

- The infective larvae are very resistant to cold and drying out so their numbers can reach high levels in the cooler months.

October 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
25 South Canterbury Anniversary Day	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19 Hawkes Bay Anniversary Day	20	21	22
23 Labour Day	24	25	26	27	28	29
30 Marlborough Anniversary Day	31 Halloween	1 Nov	2	3	4	5

THINGS TO THINK ABOUT THIS MONTH



Sheep

Do you need to drench and when?

Do a FEC test on:

- Ewes given a long-acting treatment pre-lamb during the payout period
 - If surviving worms are producing eggs seek management advice.

Do you know what drenches are effective on your farm?

- Plan to do a FECRT in summer if you have not done one in the last 2-3 years. This will require some lambs to be left untreated at the first drench.

Considerations for drenching

- Lambs do not require a docking/tailing drench except in extreme situations of low feed and poor ewe milk production.
- Drenching ewes at docking/tailing time is unlikely to result in positive production responses but may help to dry up dags.
 - The window of opportunity for fast lamb growth, and high or extended lactation from ewes is largely closed.

Consider your grazing management

- Look at all management options to improve feed quality and quantity to lambs and ewes from docking/tailing onwards.
 - Lambs are now functioning ruminants and consume an increasing amount of pasture.



***Nematodirus* species**

- Affects sheep and occasionally cattle.
- Able to survive desiccation and cold.
- Transmission can occur directly via pasture from one seasons lambs to the next.
- Sudden outbreaks of clinical disease can occur in lambs before weaning.
- Uncommon as a cause of disease beyond Southland and Otago.



Strongyloides

- Affects very young lambs and calves.
- Infection can occur via skin and suckling from dam's udder.
- Can cause temporary, self-limiting diarrhoea in lambs a few weeks old.

November 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
30 Marlborough Anniversary Day	31 Halloween	1	2	3	4 Guy Fawkes Night	5
6	7	8	9	10	11	12
13	14	15	16 Canterbury Anniversary Day (observed)	17	18	19
20	21	22	23	24	25	26
27 Chatham Islands Anniversary Day	28	29	30	1 Dec	2	3
4 Westland Anniversary Day	5	6	7	8	9	10

THINGS TO THINK ABOUT THIS MONTH



Sheep

Do you need to drench and when?

Do a FEC test on:

- Several lamb mobs to understand their worm challenge level.

Is your first lamb drench working?

- Drench check 10 individual lambs.

Do you know what drenches are effective on your farm?

- If you are doing a FECRT this summer, discuss and book with your advisor. Your FEC tests will inform you when there are enough eggs to start the FECRT.

Considerations for pre-weaning/weaning lamb drench

- Seek advice on the use of pre-weaning/weaning lamb drench. A 'traditional' first choice of lamb drench may no longer be appropriate.



Cattle

Considerations for drenching

- Dairy beef calves should not need drenching until after weaning.
- Ensure you know what you are treating. FEC testing can help determine if dirty backsides are a result of worms, coccidiosis or other diseases.

“The better feed was what picked their condition up rather than drench that wasn’t fully effective – or even drench that is fully effective maybe the feed will pick them up.”

Sam Johnston, sheep and beef farmer, Wairarapa



Barbers pole worm (*Haemonchus contortus*)

- Mainly affects sheep, can establish in small numbers in cattle.
- Death of the animal can result from blood loss.
- Danger period, later summer and autumn.
- More of a problem in the warmer areas of the north but is steadily moving south so monitoring for its presence is important.



December 2023



Mon	Tue	Wed	Thu	Fri	Sat	Sun
27 Chatham Islands Anniversary Day	28	29	30	1	2	3
4 Westland Anniversary Day	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24 Christmas Eve
25 Christmas Day	26 Boxing Day	27	28	29	30	31 New Year's Eve
1 Jan New Year's Day	2 Day after New Year's Day	3	4	5	6	7

THINGS TO THINK ABOUT THIS MONTH



Sheep

Is your weaning drench working?

- Drench check 10 individual weaned lambs.

Are eggs present and if so what type of worms are they?

- Do a larval culture on any positive FEC test to know what worm species are surviving your drench.

Considerations for pre-weaning/weaning lamb drench

- Seek advice on the use of pre-weaning/weaning lamb drench. A 'traditional' first choice of lamb drench may no longer be appropriate.

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