Deer Parasite Danagement Workshop Workbook 2020







Introduction

Managing parasites is just one of many complex operations that farmers must balance to maintain profitable, sustainable farming operations. While, on the surface, many of the options that will be discussed may seem counter to good farm practice (e.g. long rotation length or interspecies grazing) in most cases, this is a mindset issue.

Effective parasite management on deer farms requires an understanding of the relationship between the animals, the parasites and the environment. All deer farms will have some level of parasite contamination and it is neither desirable to allow this to get too high, nor to attempt to completely eradicate it. The challenge is for each farmer to achieve the right balance for their property.

Parasite management principles for deer farms are similar to other livestock farming systems. Many deer farms now have parasites that are resistant to one or more drench family actives and protecting against parasite resistance should be part of any farm plan. There is an excellent resource in 'Wormwise' that describes parasite management principles for sheep and cattle. These are equally applicable to deer farmers with a few differences.

There has been little research done on parasitism in deer specifically. Much of what is known and recommended has been extrapolated from other species and from general farming practice.

Disclaimer: The information that you take from this workshop is based on science and local experience of farmers and veterinarians. No two farms are the same and there is no guarantee that any of the methods discussed will work on your property. Some may even have unforeseen negative consequences. The authors, workshop presenters and Deer Industry New Zealand will not be held responsible for any consequences of following any advice from these workshops.

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General goals of parasite management

As a group, come up with a list of goals as far as parasite management is concerned. You can use the examples in the information book or come up with your own.



The parasites that affect deer

There are over 30 internal parasites that have been found in deer. Fortunately most of these are uncommon and generally don't cause health issues. Fill in the major parasites that can affect deer on the diagram below.

First table to get the right answers get a prize.

Choose from:

- Brown Stomach Worms:
 Ostertagia-type (Teladorsagia (Ostertagia), Spiculopteragia, (Apteragia)
- Lungworm (Dictyocaulus eckerti)
- Liver Fluke (Fasciola hepatica)
- Bowel worm or nodule worm (Oesophagostomum sp)
- Barbers Pole (Haemonchus contortus)
- Scour worm (Trichostrongylus)
- Tapeworm (Moniezia expansa)



Schematic diagram of deer pulmonary and gastrointestinal tract with rumen, reticulum and omasum removed. Original image and drawings by Pania Flint.

List the impacts of parasitism on a deer and the farm operation

Hoskin et al (1999, 2003) found about 50% reduction in voluntary feed intake and live weight gain in red deer grazing highly contaminated annual ryegrass/WC pastures during Autumn compared to deer that were drenched every 4 weeks.

Financial Impacts

Welfare Impacts

Animal - Parasite - Environment interactions (Epidemiological triangle)



The diagram above illustrates that disease will only occur when conditions are right in all three of the host, agent (parasite) and environment, and when all three are present. We can use this to understand the conditions that increase the risk of problems due to parasitism and also to identify ways to disrupt the interactions and prevent disease from occurring.

Note that the elements may all be present, but if they are unsuitable then disease will not occur, thus each intersecting circle illustrates 'suitable conditions' not simply the presence of the condition.

Exercise: At your tables, discuss the factors relating to each of these criteria that make it suitable for disease to occur.

Current Management Practices

With respect to the diagram on the previous page, what are you currently doing to reduce the impacts of parasites by managing the animals, environment or parasites? Write these down here.

Then discuss with your group and your group leader will write them onto the chart provided.

Animals

Environment

Parasite

Introduction to development of a "Toolkit"

Turn to the back of this workbook. Use this table to list the tools that are discussed for parasite management during the session. At the same time we will develop a 'toolkit' on the sticky wall.

We are going to use the next two exercises to come up with a list of tools and discuss these as we go.

Parasite Lifecycle

In your group, on the lifecycle posters, fill in the blank sections. There is one for simple stomach worms (e.g. Ostertagia species) and one for lungworm.

The instructions are on the posters.

On your poster, having completed the stages of the lifecycle, get your group leader to write down any interventions that can be used to break the lifecycle of the parasite.

Summarise these into "Tools" headings. You may refer to the information booklet for ideas.

We will now go around each group and see what you have come up with.



Back to the epidemiological triangle

In the second layer of rings, discuss and write down what is going to make the host, environment or parasite unsuitable for infection to occur.

In the outer ring write down all management practices that can be used to achieve an unsuitable host, environment or parasite.

Many of these will be similar to those discussed in the previous exercise.

Instructions:

- 1. Outside of the circles, write what members of the group are currently doing to reduce the impacts of parasites with respect to the host, environment and parasite.
- 2. In the inner circles, brainstorm and write down what makes for a suitable host, parasite or environment for disease to occur
- 3. In the outer circles, brainstorm factors to do with the host, parasite or environment that would reduce the changes of disease. I.e. make it unsuitable conditions for disease to occur
- 4. Add any extra management options, outside of the circles, that the group can think of to manipulate the host, environment or parasite to reduce the changes of disease.



Tools for parasite control

Sticky Wall – Toolkit for Parasite Control Now we will complete our list of tools and discussion on some of these.

On our sticky wall, lets make sure we have all the possible interventions that your groups have discussed.

Is there anything missing?

Let's discuss a few of these tools in more detail. The information booklet has quite a lot of information on these and some of your group will have personal experiences too!

Towards the back of this workbook you will see a table like this:

ΤοοΙ	Can I use this? How?	Pros	Cons
Rotational grazing	e.g. start moving hinds mid Jan. Rotate	Better animal nutrition	Cost of fencing - the more paddocks
	weaners through	Better pasture	the better
	Autumn.	recovery	Power for electrics
		Higher pasture production	Labour costs in moving stock
		Better soil health	Need several
		Ability to work on individual paddocks	paddocks with similar forage
		Ability to use other classes of stock	

My Parasite Management Tool Kit

Use this to record the tools that are discussed today.

Use of anthelmintic drenches

Anthelmintics are a treatment, not a preventative tool. They only kill the parasites in the animal at the time of drenching and do not prevent re-infection or remove parasites from the pasture. Drenching does not improve host immunity, but it does remove the immediate damage being done by the parasites.

The only situation where anthelmintics can reduce parasites in the whole system is when a preventative drenching programme is used during Summer and Autumn to

prevent animals from shedding parasites eggs onto pasture before animals develop 'patent' infections. This means that drenches have to be given at intervals less than the prepatent period (time taken from eating larvae to seeing eggs or larvae in the faeces).

On a flip-chart page, List the critical factors that will ensure anthelmintic drenches are effective and sustainable.

Crítical factors for use of anthelmintics

Drench Resistance

Drench resistance is a very real concern. There will be farmers here who have only ever used pour-ons and they are still working 100%. You are lucky. But there are also farms out there who have suffered the stress and frustration of multiple drench resistance! We would be wise to look across to the sheep and cattle industries which have multi-active drench resistance in several parasite species all around the globe.

Drench resistance is a farm issue, not an animal issue.

On a flip-chart page, list the factors that INCREASE the likelihood of drench resistance occurring Increased likelihood of drench resistance

A new drench for deer

Nexan corporation and Deer Industry New Zealand are currently working on the release of a new product for treating parasite infections in deer. This drench will be effective against all adult gut and lung worms. It has the following properties

- Oral formulation
- 1ml/10kg dose rate
- Maximum 28 days withholding time (may be less)
- 3 actives including moxidectin, oxfendazole and levamisole
- Higher than standard sheep and cattle concentrations of all active ingredients
- 98.5% effective against Osters in the abomasum based on slaughter trials. This is considered very good compared to other research in deer.
- Relatively LOW safety margin due to high concentration
- Ecotoxic

Monitoring

The value of monitoring cannot be overstated. Good stockmanship is arguably the most important tool for parasite management but even the best stock-people can do with backing up their decisions with some objective information. We don't have x-ray vision and can't tell whether our animals are lacking in copper or selenium; affected by an infectious disease, suffering from lack of protein, full of parasites or simply of poor constitution.

On a flipchart, list the objective monitoring tools that can be used.



In the table at the back of this booklet, you can write notes about how and when you will monitor parasitism in your stock.

Putting a plan together

Based on your list of tools and monitoring options, use the calendar provided to make a plan of what you will do and when.

If you would like further assistance with this process, contact your veterinarian or anyone who has attended this course.

Developing your toolkit and plan.

Use the information in the Parasite Information Booklet along with the following pages to think about the tools and monitoring that can be used on your property. Then you can use the calendar at the end of this handout to plan out how and when you will incorporate these tools.

Tool Kit - Prevention and Intervention.

List all the tools that have been discussed today, even those you don't like. Beside each tick if you think this is something that you can incorporate into your farming system. These are the tools in the kit, you don't necessarily have to use them all and things can change.

For further thinking you can list any pros and cons for each of the tools in the list. The first one has been done for you.

ΤοοΙ	Can I use this? How?	Pros	Cons
Rotational grazing	e.g. start moving hinds mid Jan. Rotate weaners through Autumn.	Better animal nutrition Better pasture recovery Higher pasture production Better soil health Ability to work on individual paddocks Ability to use other classes of stock	Cost of fencing - the more paddocks the better Power for electrics Labour costs in moving stock Need several paddocks with similar forage

My Parasite Management Tool Kit

My Parasite Management Tool Kit

00	Can I use this? How?	Pros	Sons

Cons Pros Can I use this? How? My Parasite Management Tool Kit Tool

My Parasite Management Tool Kit

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Cons Pros Can I use this? How? My Parasite Management Tool Kit Tool

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loolkit - Monitoring	
Monitoring tool	How and when will I use this?
Faecal egg counts	
Faecal larval counts	
Weight gain	
Drench resistance check	
Pasture larval count	

Management	Monitoring
JANUARY	
Week 1	
Week 2	
Week 3	
Week 4	
FEBRUARY	
Week 1	
Week 2	
Week 3	
Week 4	
MARCH	
Week 1	
Week 2	
Week 3	
Week 4	

	Management Monitoring
APRIL	
Week 1	
Week 2	
Week 3	
Week 4	
MAY	
Week 1	
Week 2	
Week 3	
Week 4	
JUNE	
Week 1	
Week 2	
Week 3	
Week 4	

Σ	anagement Monitoring	
JULY		
Week 1		
Week 2		
Week 3		
Week 4		
AUGUST		
Week 1		
Week 2		
Week 3		
Week 4		
SEPTEMBER		
Week 1		
Week 2		
Week 3		
Week 4		

	Management Monitoring	
OCTOBER		
Week 1		
Week 2		
Week 3		
Week 4		
NOVEMBER		
Week 1		
Week 2		
Week 3		
Week 4		
DECEMBER		
Week 1		
Week 2		
Week 3		
Week 4		

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