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"How to represent regional differences in a national programme - management of endoparasites in New Zealand"

Tarbotton, I.S.; Paine, M.S.

AgSystems (Social Research)

AgResearch,

Ruakura, Private Bag 3123, Hamilton

Abstract

Endoparasite (internal parasites) management is an important aspect of pastoral livestock farming. It involves understanding some complex biological principles and making decisions in a farm systems context. In New Zealand there is some confusion and diverse messages presented about endoparasites making it difficult for the farming industry to derive "best practice".

A programme to improve the consistency of information provided to farmers about endoparasites was established. This paper focuses on a suite of methodologies for studying regional differences in farmers perceptions and management needs with respect to endoparasites. This understanding was used to design new decision tools to assist farmers.

This paper will discuss the way the methodology set the foundation and strategy for the overall technology development of the research team and suggest possible extensions to similar national programmes.

Farmer focus groups were held in 9 selected regions. Each group performed several tasks, viz.:

- **Cognitive mapping** had farmers interactively constructing their views on the general management, regional issues, and information gaps involved in parasite management.
- **Surveying** the types of information and key people farmers use to make decisions. A paired comparison of key concepts in parasite management was included in the survey to compare across regions.
- **Transcript analysis** of group meetings enabled an analysis of farmers' reasoning that underpinned the construction of their cognitive maps.
- **Development of a regional information network** was achieved by asking farmers for other contacts who they consider have a keen interest in the topic and working interactively with these contacts when trialling new decision aids.

The relevance of this methodology to study information needs for other complex systems is discussed.

Keywords: farm system, endoparasites, participatory, management strategies

Introduction

Endoparasites (internal parasites) cause production losses to the New Zealand sheep industry of more than \$250 million annually. This loss occurs despite the expenditure

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of about \$30 million each year on anthelmintics (drenches) to control the worms. However, if such drenches were not used, sheep production would decline by an additional \$1 billion. Unfortunately, there has been a rise in resistance to anthelmintics and these drugs are becoming progressively less effective.

Within this situation the pastoral farmer is trying to balance production, market protection and market imperatives against long-term sustainability, both of livelihood and resources. One way of achieving a longer drench life (prior to resistance build up) is to reduce drenching to only strategic occasions where, either sheep well-being is paramount or the parasite is most vulnerable. Integration of this approach with grazing and livestock management requires knowledge of not only farming but parasites, chemicals and ecological principles. Farmers would ideally like to get concise relevant information on these aspects.

Even among researchers specialising in endoparasites, the respective merits of practices such as mixed species grazing, drench formulation and frequency of application, ewe-drenching and the value of faecal egg counts (FEC) are disputed. Hence these management tools are disputed in the industry and applied in different ways. This makes it even more difficult for the farmer to hear a clear message and make decisions for their own property.

This project is concerned with establishing the best ways of getting critical information to farmers by the most effective means, ensuring that the knowledge gained is applied effectively, and opportunities for improvement through further research are identified. In a sense the available pool of technology and knowledge associated with helminthosis will be mined and passed onto farmers so they can derive maximum benefit from past and future research. As a result, opportunities for improvement through further research will be identified.

This paper reports on a programme to improve the consistency of information provided to farmers about endoparasites. It focuses particularly on the stage of the programme where the baseline picture of information status (understanding) and needs are explored.

Methods

'Proven' facts about endoparasite management were collated from a literature search. The emphasis was then placed on getting a unified information flow of these facts prior to approaching the more disputed information.

Researchers involved in the programme chose regions on the basis of the livestock farming being undertaken, the climate, and to a lesser extent geographic location. The climate was broadly categorised as being warm/dry, warm/wet, cold/dry or cold/wet as it is agreed that these differences have a major effect on parasite lifecycle and persistence.

Nine regions were selected which gave a wide representation of New Zealand. The regions used were:

Northland (Wellsford), King Country (Pio Pio), East Cape (Tikitiki), Gisborne (Wairoa), Hawkes Bay (Waipukurau), Manawatu/Wairapa (Whanganui), Canterbury (Mayfield), Otago (Alexandra), Southland (Gore).

Using either contacts known in the regions or the local Sheep Council representative, 8-14 farmers were invited by a phone call to attend a focus group meeting in their region. Venues were suggested by the farmers involved and were either private farms or local residences (churches, halls, shearers quarters or hotels).

At each focus group meeting 4 methods were used to collect information that would be the foundation or baseline for future decision aid, or information tools developed.

Cognitive mapping was used as a way to allow farmers to describe diagrammatically the cause and effect relationships in endoparasite management. This was achieved with the use of a computer and datashow projector using software called Decision Explorer which allows a view to be developed by the farmers with enquiring questions from the facilitator. This tool allowed farmers to all focus on the diagram view being developed and so reach a consensus as they went. The electronic technology was soon forgotten and debate and discussion flowed.

1. general management
2. regional issues
3. information gaps

During the cognitive mapping exercise the discussion was audio taped and this was transcribed as an insight into the reasoning and debate that occurred during the mapping. The text data was analysed using NUD.IST revision 3 (Non-numerical Unstructured Data Indexing Searching and Theorizing). The computer based programme was used when coding and comparing the transcripts.

Grounded theory methodology was used to analysis the data. The distinguishes it from other forms of social research is that it builds theory inductively, from the textual data, rather than tests an existing theory that was derived from deductive principles. Significant discussions and statements about information and information providers were identified to understand preferences to the means of providing information.

As part of the focus group meeting written surveys were also completed. These collected demographic information on the farmers, their farm policies and the key informants and sources of information.

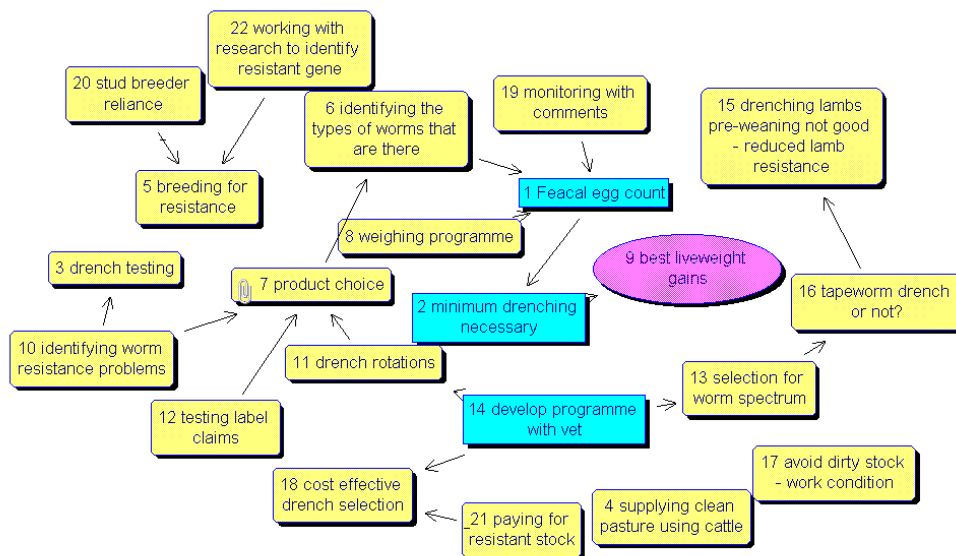
Farmers were asked to provide other contacts who they considered would be interested in endoparasites from their region. This helps to establish the regional networks which will be able to have input into the decision tools developed later in the research programme.

Results

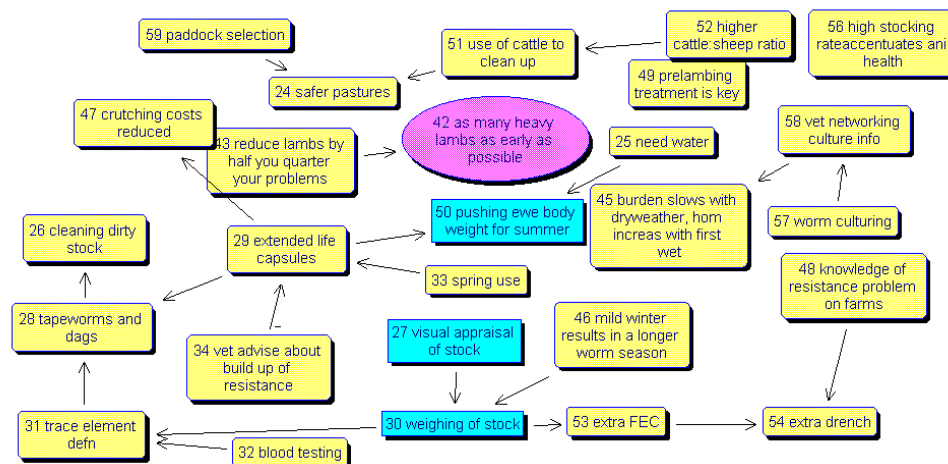
Progress to date has seen the identification of knowledge gaps and key issues of concern to farmers in the management of parasitic roundworms. In addition, belief maps have been constructed allowing exploration of linkages between motivation for control of these parasites and farmers' understanding of the problems they pose.

Below are the cognitive maps for one region as an example. In these diagrams the oval shape represents the goal, the square corner boxes (grey) the strategies and the lighter round cornered boxes the activities.

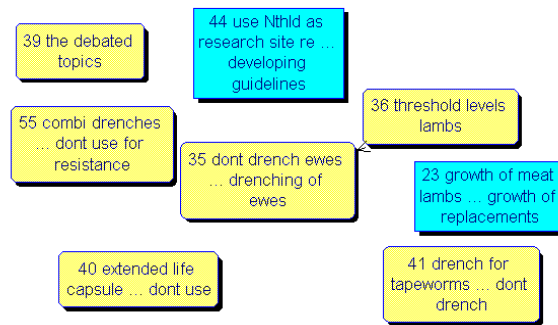
General Management (Northland)



Regional Issues (Northland)



Information Gaps (Northland)

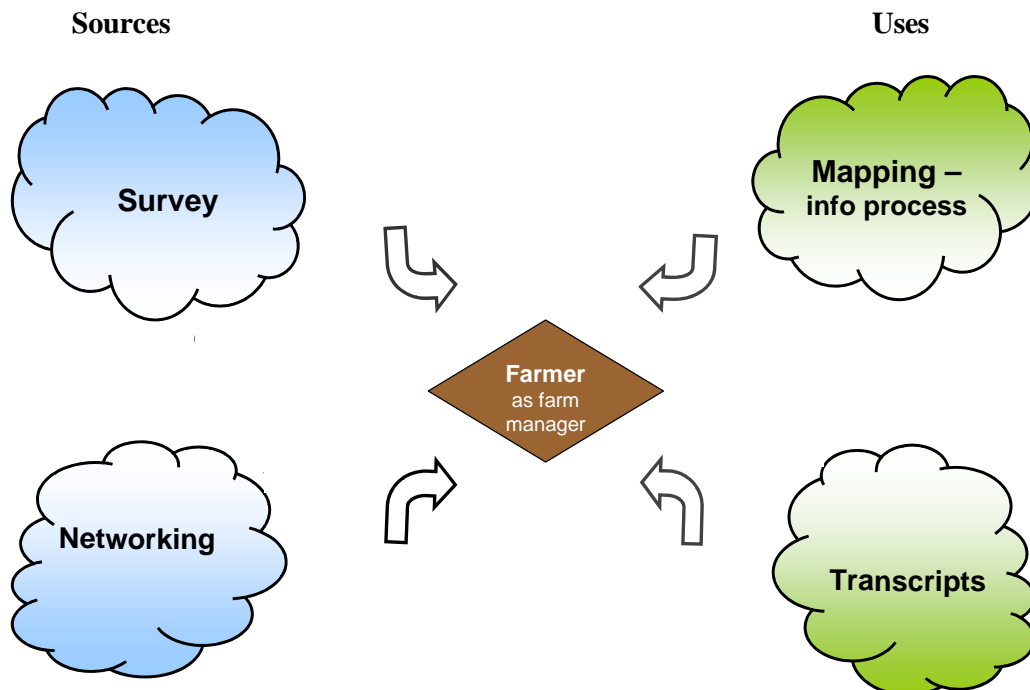


Discussion

The suite of methods combined well to make for a very busy, productive group meeting. The farmers left in good heart and particularly valued the cognitive mapping as a way of clearly summarising their thoughts and management of endoparasites. Some commented that without the “external tools and researchers they could have talked for hours and not reached such a clear consensus”.

It was repeatedly shown how different the regions are due to climate and the types of farming systems that are managed.

Description of Methodology



It became clear that information has to be viewed at three levels for Endoparasite management.

National	<ul style="list-style-type: none"> • information applicable across the country (e.g. generalised lifecycle descriptions, drench options)
Regional	<ul style="list-style-type: none"> • information modified to suit the regional differences (e.g. climate, sheep breeds)
Individual farm	<ul style="list-style-type: none"> • information aligned with a certain farm system (e.g. pasture renewal, drench resistance, and buying and selling policies)

The meeting transcript allows the debate and discussion to be analysed to understand how farmers are making decisions about endoparasites, what the motivation is for changing their management and so where external science and information can serve them best.

Summary

This research programme started with a need to get a robust baseline picture of the information status and needs. The approach also allowed an understanding to be gained of the inputs into decision making. The context was endoparasite management in the New Zealand pastoral agriculture system. Nine regions were selected based on type of livestock (sheep and beef), presence of farms, and climate. In each of the nine regions, focus groups were held with farmers. The suite of methods used in these groups had a clear purpose and set the basis for the programme.

The methods used explored the information sources by:

- surveying
- network development

and then the information uses by:

- cognitive mapping
 - transcripts
- (see Description of Methodology diagram)

This type of approach served this research well and hence would have application to similar national programmes focusing on other topic contexts.

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