UNDERSTANDING DEER FARMERS' LEVEL OF ENVIRONMENTAL AWARENESS

Tracy Payne and T. White
AgResearch Ltd, Ruakura Research Centre, Private Bag 3123, Hamilton
New Zealand
Email: tracy.payne@agresearch.co.nz

Abstract

Deer researchers at AgResearch are incorporating social researchers in their work to gain an understanding of New Zealand deer farmers' level of environmental awareness in order to provide a platform for future adoption of land care techniques. This research was designed to understand the level of environmental awareness deer farmers had with regards to specific sustainable farming practices in two regions of New Zealand. Farmers were asked for their experiences with the following practices; wallowing, waterway fencing, wintering management and fence pacing. Our findings indicate that deer farmers were generally aware of environmental concerns however, the level of awareness was influenced by their specific farm context. This included, but was not limited to, factors such as topography and soil type. Many believed they were doing the 'best they could' and therefore did not feel they needed to adopt new environmental practices.

Keywords: deer, environmental awareness, wallowing, waterway fencing, wintering management, fence pacing.

Introduction

Deer farming became legal in New Zealand in 1969 (Caughley, 1983). Deer are frequently run as a secondary enterprise in conjunction with other pastoral livestock, usually sheep and/or cattle. Unlike other mainstream farming activities in New Zealand deer are still considered wild animals and as a result do not necessarily have a good fit with conventional farming practices (Department of Conservation, 2005). New Zealand is a major world supplier of venison. While exact figures on New Zealand's share of the world venison market are not available, figures are estimated around 50 percent (AgResearch employee pers. comm., 2007). New Zealand possesses approximately half of the world farmed deer population (1.7 million estimated as at 30 June, 2006) (www.deernz.org/n5.html). The purpose of this study was to understand the level of environmental awareness deer farmers had in regards to sustainable farming practices, in order to provide a platform for future adoption of land care techniques. In order to assess environmental awareness, this study focused on four key practices; wallowing, waterway fencing, wintering management and fence pacing. Wallowing is an activity in which an animal rolls in water to satisfy certain behavioural drivers. This creates a muddy hole which is often termed a wallow. These issues are important to investigate to help improve pasture management and create a sustainable deer farming environment. The study examined the factors influencing farmers' decisions on these issues.

Methods

Consumer behaviour theory provided the methodological framework for this research. This approach enables the identification of the benefits sought from adopting a particular technology. In the case of farming the benefits resulting from adopting a particular technology depend on a range of contextual factors that are specific to the circumstances of each farm enterprise (Bewsell and Kaine, 2004; Kaine, Vigliaturo, Bewsell and Botha, 2004; Kaine, Bewsell, Boland and Linehan, 2005; Bewsell and Kaine,

2006). The research questions are designed to elicit details of the farm context and thus the benefits sought. This information can then be used as the basis for classifying farmers into segments; enabling information to be targeted at specific groups to facilitate adoption.

To identify the factors influencing deer farmers' decisions we followed a convergent interview process (Dick, 1998). Convergent interviewing is unstructured in terms of the content of the interview. The interviewer employs laddering techniques to systematically explore the reasoning underlying the decisions and actions of the interviewee (Grunert and Grunert, 1995).

We interviewed 30 deer farmers, 15 throughout Southland and 15 from Otago, New Zealand. Care was taken to interview farmers who were operating large and small scale enterprises, and whose properties were located on flat, rolling or steep terrain (see table one). Farmers were asked questions based around five key themes; demographics, waterway fencing, wallowing management, wintering management and fence pacing. Due to the small sample size we only identify the segments, rather than quantify them.

Table 1: Demographics of deer farmer properties

	Total size of property (hectares)	Size of deer block (hectares)	Total deer numbers	Total cattle numbers	Total sheep numbers
Average	423	194	1216	74	944
Maximum	2024	1032	5300	300	5900
Minimum	4	4	64	0	0

Results

Wallowing

Generally farmers accepted wallowing as a natural part of deer behaviour. Wallows tended to be kept at one per paddock and were never abandoned. However, farmers with larger paddocks (24-28 hectares) commented that there could be up to three or four wallows per paddock. Farmers believed wallows were made over time and therefore it was important to monitor each individual wallow for potential problems. Nearly a third (27%) of farmers did not believe they had any problems with wallowing.

Those farmers who believed that wallowing was a problem described one or more of five general types of difficulties, soil and pasture damage, trough damage, acceptance by meant processing plant, visual problems and danger to humans. Most farmers believed that deer focused on one spot in a paddock in which to wallow and therefore erosion and soil damage occurred over time. Another problem associated with soil damage was the damage wallows caused to pasture quality. Farmers observed that deer wallow in the wettest areas of the paddock, destroying grass. Deer can be rejected by the processing plant if they are muddy and this costs the farmer time, money and effort. When deer wallow they get muddy and farmers commented that it was not easy to clean them. Wallowing was perceived to be a visual problem and farmers did not like looking at them as they *'are unsightly'* (interviewee B). Farmers felt they needed to be aware of the locations of every wallow on the property and be able to tell anyone on the farm where they were. For example, interviewee P saw wallows as a problems as he "[had] *to tell contractors where wallows are'*. While interviewee L spoke of 800cm deep wallows on his property which were a danger to humans and other stock.

Although there was a diverse range of problems caused by deer wallowing, many farmers had implemented solutions to either halt or decrease the damage caused by them (see table two). Farmers tended to try a combination of methods to deal with wallows on their property. To stop them getting deeper and wider nearly half of farmers (46%) placed a range of available material into the wallows to try and decrease the damage. These included, rock, topsoil, lime chips, clay, straw and oyster shells. Farmers who had problems with wallowing around their troughs tried to minimise the damage by surrounding the trough with an electric wire or solid material.

Table 2: Solutions to wallowing described by farmers (percentages in brackets)

Solutions	Total
Fill in wallow with rock, topsoil, lime chips, clay or straw (or a combination of the above)	13 (43%)
Drain area and place title underground	8 (27%)
Place material around troughs	3 (10%)
Place oyster shells in wallows and around gateways	1 (3%)
Fence off area and plant trees	1 (3%)
Place farm equipment over wallows	1 (3%)
Move deer through paddock faster	1 (3%)
Leave wallow	8 (27%)

Fence pacing

Farmers accepted fence pacing as a process which occurs because the animals have not long been domesticated. Brian who caught deer by helicopter in Fiordland (in the south west of the South Island) stated that his deer *'used to pace but not to the same extent now that they have become more domesticated'*. Some farmers believed that fence pacing was especially bad during three specific times of the year, fawning and weaning, during the roar, when deer were short of feed, and it was important to recognise that deer needed a lot of space during these periods. Most farmers (88%) who saw fence pacing as a problem believed that the main problem was erosion. Fence pacing problems tended to be influenced by the soil type and weather of a region. Many farmers who stated that they did not have a problem believed it was because of their soil base. Others noted that deer were more likely to fence pace in the smaller paddocks on the property.

While there were a diverse range of problems caused by fence pacing many farmers had implemented solutions to either halt or decrease the damage caused by fence pacing (see table three). To keep the stress levels of the deer down an 'open gate' policy was implemented by one farmer to provide the animals with more scope. During the roar, some farmers gave the Stags larger paddocks to provide more room. To provide the deer with clean feed, 20 percent of farmers interviewed fed their deer supplements, which they believed resulted in deer decreasing fence pacing. Other farmers moved their deer frequently so that paddocks stayed clean which avoided fence pacing.

Table 3: Solutions to fence pacing noted by farmers (percentages in brackets)

Solutions	Total
Move deer regularly to keep grass clean	7 (23%)
Feed supplements	6 (20%)
Put deer in large paddocks	4 (13%)
Put electric outriggers along fence lines	3 (10%)
Do not wean the deer	2 (7%)
Put gravel along fence lines	1 (3%)
Have an 'open gate' policy	1 (3%)
Put rock along the fence lines	1 (3%)

Waterway fencing

Better water quality and aquatic habitat, more stable banks and a decrease in stock losses are all perceived benefits of fencing waterways (www.dexcel.co.nz/data/usr/f4t_cleanstreams_w_4-5.pdf). The terrain and nature of the waterway provided an indication of the practicality of fencing, and thus information on farmers' propensity to fence. Many farmers described waterways on their property which ran the entire year, others had waterways that ran only at certain times of the year, or had a mixture of both. Only one farmer interviewed had no waterways running through their property. There are many interrelated variables to evaluate when considering waterway fencing including the terrain, and the type of waterway that is present such as permanent versus temporary or meandering versus direct. The Resource Management Act (1991) describes a waterway as something that runs at any time of the year and therefore a full discussion and clear definition is needed for practical use. The terrain of a property can also impact on the practicality of fencing off waterways. Many of the farmers' interviews felt it was neither practical nor possible to fence off every waterway on their property due to the terrain. Some farmers indicated that if they were forced to fence off, they would have to retire paddocks from deer altogether as it would be too expensive and render the paddocks unproductive.

Deer farmers were classified into segments based on why they did or did not fence off waterways on their property. The segments are outlined in Figure one. Segment One consisted of farmers who saw fencing off their waterways as a priority because of the need to control stock movement. Part of this control was ensuring that the stock did not have access to dangerous terrain. Interviewee A was an example of farmers in this segment with two waterways running through the property (rolling terrain) which are 90 percent fenced. The motivation for fencing off the waterways was to reduce fawn losses and make sure the stags were safe as they are high value animals.

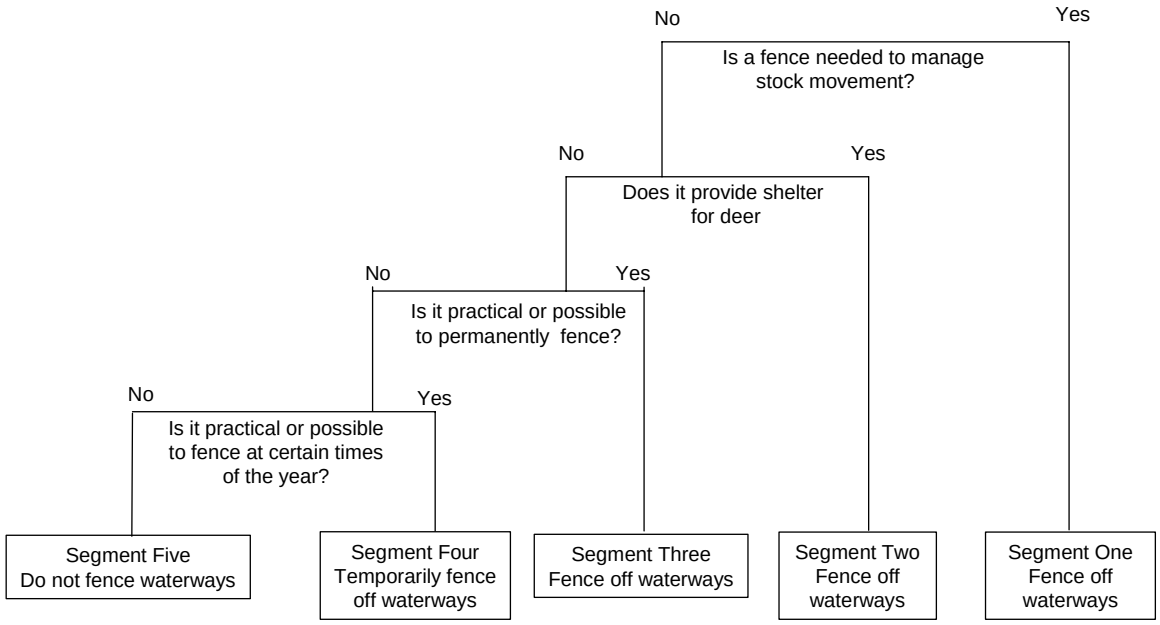
Segment two included farmers who fenced off waterways in order to provide shelter for their deer. These farmers did not necessarily feel that a fence was essential for controlling stock movement. They wanted to provide appropriate shelter for their deer. An example of a farmer from this segment was interviewee D who had four waterways through the deer block (rolling to steep terrain). His main motivation for fencing off the waterways was to protect the trees which were planted within the riparian strip to provide shelter for the deer.

The third segment consisted of deer farmers who felt it was practical and possible to permanently fence off the waterways on their property and were motivated to do so for a number of reasons. They did not mention the need to manage stock movement or provide deer with shelter as a reason for fencing. Interviewee I was an example of a farmer from this segment. There was only one waterway on this property which ran throughout the entire year, and one other which ran for half the year. This interviewee had fenced off his waterways and one of the benefits was that his deer were free of mud.

Segment four consisted of deer farmers who temporarily fenced off their waterways at certain times of the year. These farmers did not feel that waterway fencing was needed to manage stock or provide deer with shelter and they did not believe they needed to permanently fence the waterway. Often they felt it was impractical to fence the waterway permanently. An example of a farmer from this segment was interviewee G who has one waterway running through the property (rolling terrain). The waterway is temporarily fenced off for three months of the year when the deer are wintered in a block of trees which is near the waterway. This interviewee believed it would be difficult to fence off the waterway permanently due to the base of solid rock and the nature of the creek.

Farmers in Segment five did not fence off their waterways. Waterway fencing was not a farm priority for this segment. These farmers believed that it was not practical or possible to fence off their waterways either permanently or only at certain times of the year. These farmers did not have any particular issues controlling stock movement and had no need to provide shelter via the riparian strip. Interviewee K was an example from this segment. His property (rolling to steep terrain) had eight creeks running through it. When he brought the property the waterways were not fenced off. He has not fenced off the waterways as he believed it is impractical to do so due to the terrain and the associated expense.

Figure 1: Typology of segments for waterway fencing



Wintering management

Farmers did not identify deer pugging the soil as a problem. The adoption of wintering practices was influenced by feed requirements and the resources available to farmers at the time (see table four).

Table 4: Wintering practices (percentages in brackets)

Wintering practice	Total
Deer fed supplements	28 *(93%)*
Deer separated into mobs (i.e. fawns, hinds, stags)	25 *(83%)*
Slow pasture rotation with supplementary feeding	9 *(30%)*
Deer put into sheltered paddock or area	5 *(17%)*
Feed pad used	3 *(10%)*
Wintering shed used	3 *(10%)*
Open gate policy	1 *(3%)*

Farmers fed their deer a variety of supplements including; silage, hay, swedes, balage, grain/barley, kale/chou. The choice of supplement often came down to cost. Most farmers separated their deer into mobs for feed requirements. Many farmers fed their weaners on a paddock of swedes during the winter period. This gave the deer extra supplement and stopped pasture and soil damage over the rest of the farm. However, other farmers allowed their weaners the 'run of the farm' and supplemented their diet of grass with balage and/or grain. Hinds were put into one paddock or a block of treed for two months and fed silage, to stop the pugging of grass. Other farmers fed their hinds on a slow pasture rotation, moving stock once a week, on Swedes and grass, again to provide the deer with enough nutrients for the winter.

Conclusions

The purpose of this study was to understand the level of environmental awareness deer farmers have through examining the factors influencing decisions on four key practices. Waterway fencing was a sensitive topic, with many farmers arguing that it is impractical to fence off every waterway on their properties especially if they do not flow all year. Wintering management was influenced by feed requirements and this in turn was influenced by the price of supplements and the returns gained from deer. Wallowing was considered a natural phenomenon and there was a general level of 'just dealing with it' amongst farmers. While farmers raised a number of issues caused by wallowing, most had attempted to decrease or stop the specific problem depending on their farm context. Finally, fence pacing was seen as a part of deer farming and something which occurred at specific times of the year. The level of environmental awareness amongst deer farmers varied depending on their current practices. These research findings are useful for local regulatory authorities and farmers alike. Some environmental issues are localised and therefore local regulatory authorities can focus on particular environmental issues in specific areas. In addition, farmers wishing to mitigate the problems of the four practices can learn from what other farmers are doing. Generally farmers were aware that they could implement better sustainable practices with regards to waterway fencing, wintering management, wallowing and fence pacing. However many farmers believed it was not always practical or possible due to their specific farm context or the cost involved, especially considering the economic climate of the industry. Many farmers believed they were doing the 'best they could' and therefore did not feel they needed to adopt new environmental practices.

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