# Perceptions of sustainability of farmers with dairy support land

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## ABSTRACT

This project investigated how successful dairy support land (DSL) farmers perceive sustainability, how they use DSL to achieve their goals and the way that these perceptions vary across locations and types of DSL. Seventeen farmers were interviewed using Yin's case study method (Yin, 2003). The list of interviewees was derived from focus group meetings with rural professionals undertaken to assist with developing a set of theoretical propositions regarding sustainability. Separation into economic, environmental and social sustainability does not reflect how farmers understand or perceive sustainability of DSL. Their perceptions are better described by separation into issues internal to the farm system and issues external to the farm system. Those who acquire DSL do so primarily in order to reduce the number of factors that fall outside the farm and outside their control. For those interviewed, feed grown is the best measure of the effectiveness of DSL management; more feed grown means more control over cost of bought in feed and cow condition. For DSL to be sustainable (i.e. to grow feed), it must be fully resourced. There must be time to plan and carry out essential tasks and environmentally important developments such as riparian fences and stockwater systems should be in place. If the DSL is not fully resourced, loss of control will result in unreliable supply of feed, cows calving in poor condition and overextended farm staff and management. Poor control over environmental effects is also highly likely. There is little difference in farmers' perceptions of sustainability and practice across a variety of soil and climatic conditions in Canterbury and Southland..

**Keywords: s**ustainability; dairy support land; farmer perceptions; Yin's method**.**

## INTRODUCTION

Many dairy farmers in the South Island rely on dairy support land (DSL) to graze cows over winter, rear young stock, control feed supply and/or produce supplements (Richards, 2006, O'Conner, 2003).

Some observers have argued that the inclusion of DSL in an intensive dairy system often results in problems as management and other resources are over-extended (Davis, 2005; Thorrold, 2000). A loss of management focus on the dairy farm, neglected DSL, sub-optimal crop or pasture yields, environmental damage and poor financial performance may result (de Wolde, 2006). Furthermore, observers have suggested that DSL allows farmers to transfer environmental problems to the DSL, rather than dealing with them on the milking platform (MP).

There are very few documented investigations into the issues associated with DSL and their solutions, and few data exist on how DSL sustainability varies regionally or across types of unit. We postulated that the way successful DSL farmers perceive sustainability and how their views relate to practice would be valuable in better understanding sustainability issues within dairy systems that include DSL.

The objectives of this research were to examine how successful farmers perceive the sustainability of DSL and how this applies across locations and types of DSL. Specific research questions were:

1. What are the perceptions of sustainability of DSL farmers who achieve business, environmental and social goals?
2. How do the perceptions of sustainability of DSL farmers relate to practice on their DSL?
3. How do perceptions of sustainability and practice vary across groupings or regions?

## METHODS

Data were collected and analysed using Yin's Case Study Method (Yin, 2003). This method was chosen because it allows practice to be understood in context. Each dairy farming system faces a unique set of conditions and constraints that may influence how the farmer considers sustainability and how he/she achieves a sustainable system. The method also provides a means to draw on prior knowledge and industry experience while minimising unfounded assumptions and bias.

Yin's method defines a set of 'theoretical propositions' and in each case, an alternative, mutually exclusive 'rival explanation' addressing the research questions. These guide preparation of interviews and collection and analysis of a 'chain of

evidence', help maintain validity and gain improved insights into the situation under study.

Two focus group meetings of farm consultants were used to develop the propositions and identify potential case studies. Successful DSL farmers were chosen to ensure situations where strategic decision makers thought about and tried to achieve a sustainable farm system. Seventeen case studies were conducted across locations in Canterbury and Southland. Each included a structured interview, direct observation and photographs of the current situation and practices, and collection of any existing records and relevant documents. Data were coded using the software QSR NVIVO 7 and analysed by pattern matching against the propositions and rival explanations. Further details are given in Bennett *et al*. (2010).

In total 29 propositions and rival explanations were examined. An example proposition is given below and this is followed by a summary of the key findings.

*Proposition: Commercial returns are the most appropriate measure of economic performance of DSL.*

*Rival Explanation: In measuring the economic performance of DSL, feed grown is a better measure of economic performance than commercial returns.*

## WHAT ARE THE PERCEPTIONS OF SUSTAINABILITY OF DSL FARMERS WHO ACHIEVE BUSINESS, ENVIRONMENTAL AND SOCIAL GOALS?

During the analysis, it became clear that farmer's perceptions of sustainability are not well described simply by separation into economic, environmental and social sustainability. Farmers see sustainability in their own terms and their perceptions are best described by division into internal factors they can control and external factors that are difficult to control. They are concerned about external variables they cannot control and acquire DSL to manage these. Several mentioned that they believed that DSL was a great improvement on previous land use, more money was being made with secondary economic benefits to the local economy. They saw that by using the land more responsibly they were fulfilling their obligation as farmers in terms of stewardship and responsible use, and leaving the land better than they found it.

Division into economic, environmental and social sustainability nevertheless remains useful in understanding farmer goals with DSL and how farmers attempt to use DSL to internalise or control external factors.

### Economic sustainability

Participants were all of the view that addition of DSL enhanced the overall economic sustainability of the dairy system relative to the cost of buying the services on the open market. Additional, intangible benefits of using DSL including enhanced production from better cow feeding over winter, preventing damage to pasture on the MP in early spring where closely located DSL allowed staggered returns to the MP over calving, and avoiding exposure to a volatile and uncertain feed market.

However, it was accepted that the addition of DSL creates new risks to the system which may include under-performance of the DSL block and loss of management focus on the milking platform.

Most farmers assess the performance of DSL in terms of quantity of feed grown, rather than economic indices such as profit or return on investment; success with DSL requires that cows are fed properly and that costs are controlled. Of the 17 farmers interviewed, only one believed that commercial drivers should be an important part of strategic decision making on DSL. Even then, feed grown and thus the number of cows that could be supported by the DSL unit was still the primary indicator of the success of competing commercial drivers.

Farmers were very aware of the need to contain costs and would strive to achieve low cost DSL operations; the ability to farm at low cost was seen by many as one of the advantages of DSL ownership.

Making the farm system more self-sufficient and avoiding reliance on others for support services is the primary purpose of all the DSL systems examined. However it became clear that, in the right circumstances, DSL may be involved in expansion as well, eg. as an intermediate phase in conversion to a dairy farm, gradually developing soil fertility or drainage, etc. This appeared to be more common in Southland where there is a lower dependence on irrigation, allowing gradual expansion of the MP. On the other hand, some DSL blocks had shifted from a business growth orientation to a self-sufficiency orientation as the farm system (or farm owner) matured. Thus, the role of DSL may change over the life cycle of the farm.

### Environmental sustainability

DSL is likely to enhance environmental sustainability of the dairy system so long as appropriate infrastructure, development and land use are in place. All those interviewed professed to be concerned, to some degree, about environmental issues and were confident that the environmental impact of the systems they were responsible for was

under control. While this could not be substantiated in any systematic way, there were many examples of environmentally good practice observed by the interviewer such as the design of water systems, retaining near-stream vegetation, riparian fencing, back fencing on breaks, protecting existing pasture (on grass), care in selecting land with appropriate soils types for use as DSL, and others. At sites where negative impacts were apparent, this was seen by the farmers as a temporary phenomenon which they planned to address.

Where ongoing problems were reported, this related to lack of resources, lack of development, or structural problems on leased DSL. Problems tend to occur on leased blocks where there are no arrangements with the landowner to address development issues, or insufficient time to benefit from, or recover, invested capital.

*Social sustainability:* At several sites it was evident that the addition of DSL has the potential to amplify existing social problems; operations managers become over-extended, staff work unsupervised and any incompetence or mistakes become more obvious. Problems include underfeeding or neglecting to feed cows and increased pressures on management as they have to deal with staff problems instead of carrying out other essential duties.

## HOW DO THE PERCEPTIONS OF SUSTAINABILITY OF DSL FARMERS RELATE TO PRACTICE ON THEIR DSL?

### Resourcing the DSL

Adequate resource allocation to DSL is the key to achieving a balanced and sustainable farm system and was seen as important in all cases. 'Resources' include physical inputs such as feed and machinery, management time and *in situ* developments. Resourcing is fundamental to planning, saving costs, managing staff, feeding cows properly and managing environmental impacts so that the system performs as intended, cow condition is controlled and the MP protected from damage to, or loss of pasture in winter and early spring. Extra staff, paying more to attract good staff, buying extra machinery, upgrading water systems, good fencing with back-up generators, or increasing support for management including education to gain additional knowledge may all be necessary.

There was mixed evidence for the best way to prevent management overload on DSL systems. At some sites it appeared that a well-supported management structure functioned at a high level despite the addition of DSL. At others there was evidence that a dedicated management structure with specific individuals responsible for the DSL was the only way of preventing problems for management.

### Planning, implementation and control

Planning is important to success on even very simple DSL systems. Planning is subordinate to resources because time to plan is in itself a valuable resource. Failure to plan will lead directly to wasted resources as the farmer finds other ways to ensure cows are fed properly and that the MP is protected.

Several farmers mentioned the time and energy they put into planning, the time they spend thinking about their farms, looking around and consulting with advisors. The focus of planning was on growing good crops, transferring feed to winter, and maintaining pasture quality.

There was strong evidence that timing and attention to detail play a major part in success with key areas, otherwise resources are expended for sub-optimal results. Areas requiring attention include forage crop establishment, maintaining pasture quality in spring and soil protection.

There was also evidence that formal monitoring programs are not necessary if there is sufficient management skill and experience in place, particularly where there is a reason for management to be in every paddock every day. Even though most did not do formal monitoring, those interviewed appeared to be highly aware of what was happening. The use of indicators was quite common; the state of hay feeders as an indicator of feed allowance for example or the yield of whole crop silage as a measure of soil health.

### The use of graziers

Relying on a grazier to supply crucial support services was perceived as risky by all those interviewed. Graziers may be incapable of providing the level of care that dairy farmers require, fail to grow enough feed or to look after cows properly. Despite these perceptions, a number interviewed used graziers without major problems.

Successful grazing relationships begin with communication and involvement. Building trust and developing a professional and honest relationship is important, and applies to both the grazier and the dairy farmer. The risk of using a grazier was reduced if there was a small area of DSL available; it is better to have some DSL and partial control than no control at all.

### Trade-offs between environmental and other aspects of sustainability

All farmers interviewed were positive of their ability to bring economic and environmental drivers into line. In fact, most believed failure to perform in an economic sense and negative environmental impacts are linked.

Careful management of fertiliser and nutrient inputs is necessary to ensure fertilizer is not wasted

and to avoid nutrient loss into aquifers or streams. Nutrient management includes nutrient budgets, timing of fertiliser application and use of nitrification inhibitors.

Appropriate tillage methods were important to minimize costs, safeguard crop yields and ensure good quality pastures were re-established. In some situations, minimal tillage will result in reduced costs and a more resilient soil structure, while on heavier soils cultivation will help manage soil health, give more reliable yields and control weeds without relying on sprays.

Good grazing management leads to good pasture quality and fully utilised pasture, which reduces the need to apply nitrogen fertiliser and results in silage cuts, which in turn helps to control pasture weeds thus reducing the need to spray.

The ability to resolve environmental and economic drivers is impeded if appropriate developments (stock water systems or drainage) are not in place.

Although sub-optimal outcomes did occur on DSL at times, this seemed to be accepted because part of the role of the DSL is to protect the MP from variations in climate or feed markets to ensure that the MP can continue to function at a high level. When forced to choose between sustainability of the DSL and sustainability of the MP, the MP will always come first.

The state of the DSL may be an indicator of the sustainability of the overall system; if the system is under pressure, economic loss, environmental damage or management overwork will become evident on the DSL indicating systemic problems that may not yet be evident on the dairy farm.

## HOW DO PERCEPTIONS OF SUSTAINABILITY AND PRACTICE VARY ACROSS GROUPINGS OR REGIONS?

### Leasing vs ownership

Eleven of 17 farmers interviewed had at least some involvement with leased DSL. At the time of the interviews, the cost of leasing was substantially lower than servicing an equivalent debt. Leasing frees up equity for investment elsewhere and allows farmers to control support services and grow their business without the expense of land purchase. It suits dairying because it compliments the capital intensive dairy farm.

The primary limitation of leasing is the short timeframe of most contracts. There may be a lack of capital inputs and with poorly worked out lease agreements, farmers have to balance the need to invest to get the best out of the land against the time required to benefit from, or recoup, any investment. There may also be a lack of environmentally focussed development and/or disagreement about which party should pay for what.

### Adjacent DSL

It appears to be easier to achieve sustainable farming on DSL that is adjacent to the MP. Marginal land that is too small or of insufficient intensity to be viable as independent DSL units may still be viable if adjacent to larger intensive grazing units or MP areas because they provide partial support that greatly reduces the risk of relying on graziers.

The most economically effective DSL may be a relatively small, leased unit, adjacent or very close to the MP which can be used to capture cost savings and to protect the MP at key times; eg. when grazing would result in soil damage and runoff. However, it is important to be mindful of what the land is really capable of and to resource the DSL unit appropriately. While adjacent DSL is valued by those who have it, it does not appear to be essential to achieving sustainability.

### Soil types

Farmers prefer light, free draining soils for use as DSL because they are easier to manage when wintering cows. Nevertheless excellent results were reported on heavy soils. All soil types have to be managed properly and resourced well to prevent damage to soil structure or nutrient runoff over winter. Resources such as good stock water systems, drainage and the right machinery have to be in place, regardless of soil type.

### Pasture vs crops

Wintering on grass is believed to improve control of feeding, be better for animal health by avoiding diet changes, and possibly enhance spring production. There are also cost savings and synergies with other enterprises such as youngstock grazing and silage making. Ideally all-grass systems are irrigated giving control over pasture growth and quality and mitigating the risk of insufficient feed.

Forage crops allow wintering more cows on a smaller area while lowering the risk of all grass systems being unable to fully feed cows in winter. The main difficulties with crops are the costs involved and dietary issues that can occur. For the system to be sustainable, farmers must maximize crop yields and minimize the impact of cows on the soil over winter.

The choice to use crops or grass depends on the quantity of feed that can be reliably grown. For example, it is not feasible to rely completely on grass for winter feed on dry DSL in Canterbury, while in parts of Northern Southland, the summer dry means that it can be very difficult to grow good crops so that grass may be a better option.

**Canterbury vs Southland**

There was little evidence of differences in how farmers perceived sustainability between Southland and Canterbury. The fundamental issues of sustainability and the type of practices required remained consistent across both areas. Those differences that were apparent related to rainfall, soil type, environmental concerns and intensity of production.

In both regions, farmers tended to measure the success of DSL (or new practices on DSL) in terms of the amount of feed they could grow. Systemic issues such as resources and planning, management overwork, and the potential for DSL to aggravate or alleviate staff problems were the same. Farmers in both regions saw the public perception of dairy farming driving increases in compliance costs.

The main observable difference between Canterbury and Southland was one of intensity; Southland dairy farms are relatively less intense than Canterbury dairy farms in stocking rate and production per ha. The consequence is a decreased need for feed inputs and possibly a reduced exposure to the feed market whereas in Canterbury, the higher intensity of the MP means that there is a strong driver to control costs of support services.

There were difficulties locating case studies in the southern part of Southland although two cases were included. Several farmers had converted, or were in the process of converting their DSL to milk production. Despite heavier soils requiring different development or management techniques, the main considerations were nevertheless the same. Thus, although it is possible to achieve sustainable outcomes with DSL in southern Southland, it appears that the best economic use of land is milk production.

## CONCLUSIONS

Dairy farming systems are exposed to a number of external risks and DSL is one way of managing them. Whatever means are used, time and money need to be invested for the dairy farming system to be sustainable.

Quantity of feed grown is seen as the key measure of performance on DSL and participants believed that they are successful in using DSL to control cow feeding over winter and that environmental risks are contained. However, some social impacts may need to be managed.

To manage production risk while avoiding undesirable impacts on staff, management or the environment, the DSL must be well-resourced, there must be good planning and timing and attention to detail with critical tasks like crop establishment.

There are a wide variety of DSL situations, but the fundamentals of practice remain constant; the same concepts of sustainability and practice apply across all types of DSL regardless of location or local conditions.

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