

# Upper Waikato nutrient efficiency study farmer follow up

Prepared by:  
AGFIRST Waikato

For:  
Environment Waikato  
PO Box 4010  
HAMILTON EAST

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Chris McLay

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# Upper Waikato Nutrient Efficiency Study Farmer Follow up

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## *Agfirst Waikato Contacts*

*James Allen*                      *0274 743 093*

*Email:*                              [james.allen@agfirst.co.nz](mailto:james.allen@agfirst.co.nz)

*Address:*                          *PO Box 9078, Hamilton*

## Introduction

The upper Waikato Nutrient Efficiency study was completed in 2009. Farmers had the opportunity to attend a meeting to discuss the overall findings shortly after. A follow-up visit to each participating farmer was carried out to determine what changes had been adopted as a result of the initial analysis, and to review the extension process used.

On farm meetings were carried out by the AgFirst consultant and Ross Abercrombie (Environment Waikato) with all farmers in the study, and were well received and appreciated.

This document summarizes the overall themes from the on farm meetings, as well as notes from the visits.

## Summary

The visits were well received and appreciated. Time is often requested of farmers for projects and the follow-up does not eventuate. Farmers generally valued the comprehensive nature of the study, particularly the effort put in to address the financial implications of the lower leaching scenarios.

Overall there were only small differences in the feedback between all dairy farmers in the study. The higher intensity farms appear to carry a larger financial cost in reaching the 26kgN/ha leached target. This was reflected in stronger sentiments about the very low N leaching scenarios being less practical from a financial viability perspective.

The sheep & beef farms were all at a lower N leaching level than their dairy counterparts. The reports and scenarios analysed were generally well received, although farmers indicated they felt under-represented at the follow-up meeting in late 2009. Two of the three farmers had made some changes to their stocking policies as a result of the analysis. The issues of raising understanding of N-leaching and also Land Use Capabilities (LUC) came through as recurring themes.

The wide range of farmer circumstances, systems and background understanding meant the discussions and responses were quite wide and varied. While some common themes are apparent the full interview responses should be read in their entirety as they give insights into how different groups within the farming community saw the project and the challenges.

The summaries below group farmer responses into four headings, these are:

- Direct result/uptake of the study on farm,
- Feed back on the low leaching scenarios,
- Feedback on the extension effort required in future,
- Any additional points raised

## Direct result/uptake of the study on farm

### From the dairy perspective.

7 of the 14 farms had implemented parts of the various scenarios in areas they felt most relevant to their farm system. Only those strategies that have a positive or at least cost neutral benefit have been implemented to date.

The area covered by effluent irrigation on farm increased on four of the study farms. There also seemed to be a greater awareness of the need to plan N applications, particularly around the use of winter applied Nitrogen.

Five farmers were attracted to the idea of a reduced stocking rate, but there was a general fear that the required increase in per cow production may not eventuate. This deterred most from implementing this strategy. This would appear to be an area that could benefit from an increased extension effort and the method of using focus farms would assist in farmers' belief in the topic.

The direct drilling of crops as opposed to conventional cultivation methods was a practice that 4 of the study farms were intending to implement this coming season. One farmer had carried out a field trial and used direct drilling of turnips on half his cropped area and conventional cultivation on the rest to prove to himself whether it worked (he observed no difference in crop yield). This is linked to the expressed desire to see more on farm examples of strategies successfully implemented.

### From the sheep & beef perspective.

There was an improvement in the way nitrogen fertiliser was being used with more awareness of the increased risk of use during winter, although this sector used much lower rates than dairy farmers.

Two of the three farmers visited had made changes to their stocking policies, for a mixture of financial and environmental reasons.

There was an increased awareness of the issues surrounding environmental sustainability, and also an increase in the concept of using LUC's for designing farm systems.

## Feed back on the low leaching scenarios

The common themes among the dairy farms included:

1. Increasing effluent areas was a common improvement in many of the scenarios. This had been either done or was actively being investigated on a number of the properties. Comment was passed that this is often done because of concerns about high Potassium levels affecting animal health. Reduced N leaching losses was a secondary benefit.
2. Carrying out actions for ease of management or financial gain were reoccurring themes for most involved. Co-benefits of environmental improvement may be seen but these are usually secondary in the minds of the farms involved.
3. Reduced stocking rate but improved per cow performance was largely endorsed as a concept and understood by the study farmers with these scenarios. However, there was



considerable discussion about the skill level required by farmers and their staff to implement and to achieve the required lift in per cow performance. A slightly higher stocking rate was seen as lower risk from mismanagement of pasture. This strategy is important from an environmental management perspective but also a key factor in improving on-farm productivity. There was considerable willingness to entertain this approach if the risk reservations could be allayed. This scenario was one where the farmers involved felt some good on-farm trials locally demonstrating high per cow and low stocking rate would aid in them believing it could be done without farm system failures.

4. There is a need for technologies to be proven. For example, nitrification inhibitors (DCD) had little if any uptake on the basis farmers did not believe the science was robust enough.
5. There was a consistent reluctance to invest in infrastructure required to lower nutrient loss until the rules or policies are known. The example given several times was the move away from effluent ponds 10 years ago, whereas on farm storage now appears to be a requirement. Farmers asked for clarity and certainty before they can be expected to invest.
6. Removing winter grazing as an option in the 26kgN scenarios was of concern. To manage without winter grazing, either stocking rate had to be reduced or capital investment in infrastructure to feed supplements was required. This was seen as a departure from the industry's perceived competitive advantages, and most farmers challenged this idea without firm policy outlined first.

The common themes among the Sheep & Beef farmers included:

1. The "easy" scenarios in the study were generally endorsed. When there was a significant impact on profitability the reaction was less receptive.
2. Tighter restrictions? Some farmers commented that the sheep & beef industry was being penalized more than the dairy industry because they had to meet more restrictive standards and it was felt it was more difficult to make the required changes (note this is farmer opinion).
3. Available tools. Sheep & beef farmers also felt their suite of tools was much smaller than their dairy counterparts, possibly due to dairy farm industry's investment in tools over the past decade.

Because of the variation in systems on sheep & beef operations the scenarios tended to be more farm specific.

## **Feedback on the extension effort required in future**

### From the dairy perspective;

It was generally felt that anything that kept the momentum rolling on environmental themes was a good thing. Reporting on and publicising the progress that has been made came through as a requirement to maintain farmer engagement.

Generally farmers wanted to see that progress could be made on these topics with their own eyes. Identifying farmers who are already implementing some or all of the strategies identified in the study and who are open to sharing their experiences was seen as key to getting buy-in from the wider farm community. This was described as a focus farm or monitor farm extension method to showcase good performance both financially and environmentally.

Bringing stronger environmental reporting and awareness into the DairyPush program came up several times, particularly from South Waikato farmers in the study. It appears that this program has shifted attitudes and approaches to financial management for the participant farms and that this model could be a useful tool in improving environmental management<sup>1</sup>.

There was a suggestion that future studies need to look at the regional economic impacts beyond the farm gate. Generally the very low leaching scenarios did impact on milk output. What downstream impact would this have on export earnings and jobs in associated industries both locally and regionally?

There was strong comment from one participant about the need to consider an efficiency measure such as kgN/kgMS. This was on the basis the more intensive farms appeared to have up to double the milk output but currently leach little if anything above the regional average on a KgN/ha measure.

Many discussions focused on where the study farmers saw policy development going in the upper Waikato. The study farmers felt that an incentive based approach to companion a penalty system was seen as constructive. Alongside such policy interventions there was a need for clear messages with clear rules that could be defined at an on farm scale. These views were held by a large number of study farmers.

As mentioned earlier, technologies that are supported by science and contribute to profitability were seen as important. An example of this would be more information on the effluent technologies employed worldwide, particularly on methods of sealing holding ponds that allowed for mechanical desludging and retained a pond seal.

Linking environmental progress to succession planning was put forward by one farmer. It was felt that most farmers like to think they leave farms in a better state than when they took them over. Tapping into this sentiment was seen as constructive to gain support for messages.

#### From the sheep & beef perspective:

There was a desire to see the 'monitor farm or focus farm' approaches to demonstrating potential gains in managing the challenges of optimising farm profitability while reducing environmental impacts.

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<sup>1</sup> DairyPush phase 2 has just begun in July 2010. This programme now shifts focus from the initial goal of increasing profits by 10% to a new range of environmental targets including lowering N loss by 20% over the next three years. This group is now enlisting support in kind from EW.

It was also felt that the general level of understanding of Nitrogen use was lower in the sheep & beef sector (compared to dairy) and programs that would improve the efficiency with which N is used would be valuable.

Improving the farmer understanding of Land Use Capabilities, and how this could improve both farm profitability and environmental outcomes, was also seen as beneficial.

## **Additional points raised**

### From the dairy perspective:

1. The regional impacts arising from reduced milk flow in the Waikato came up several times as a farmer response to the study direction. It was seen as a significant advance to take this study through to the on-farm economics including capital impacts, but the regional and national economic impacts were also seen as important for informed decision making.
2. As mentioned earlier there was a strong emphasis by one of the participant farmers for an N efficiency measure such as kgN/kgMS. This was linked to the need to maintain regional economic performance and ensure high input farm operations remain viable post policy change.
3. Another participant raised the current duplication/overlap of effort going on in the catchment with many companies all carrying out similar work but with different focus. This participant listed EW, DairyNZ, Fonterra Sustainability specialists, and reps from three fertiliser companies all carrying out planning and trying to improve environmental outcomes surrounding nutrient and effluent management. The problem seen with this is not only the duplication of paid staff resources, but the larger challenge of consistency of messages. Even within the three main fertiliser companies there was a variation in recommendations from the field reps. This participant identified that this apparent conflict of views is an impediment to gaining farmer buy in and until the “experts” get the story straight farmers are going to be confused and not act to sort out any issues.
4. There were two farmers who talked about the need to understand Phosphate pathways and the possible impacts. They also suggested that perhaps the Waikato may be phosphate limited rather than nitrogen limited (with regard to environmental impacts) and would like to see work to clarify this area.
5. One of the dairy farmers questioned why sheep & beef farms had a lower leaching allowance than dairy farmers. This appeared to be linked to the inability to use winter grazing in the very low leaching scenarios. If the dry stock blocks had a similar allowance to dairy farmers then winter grazing would be an option.

### From the sheep & beef perspective.

1. Two of the farmers felt strongly that the sheep & beef involvement was under represented. This seemed to relate to the Putaruru meeting in particular when most of the discussion had a dairy focus. Most farmers in the study felt further work with industry involved was required to cover the many types of farm systems used on farm (e.g. dairy grazing, deer, and

bull beef systems). It was felt that the average farm leaching used to define the initial leaching target was too low, and did not reflect the variability of farm system types used in the upper Waikato.

2. When thinking about the possible policy interventions out of this study, the participants felt that there were a few areas where more forethought/research was needed. These included more work required on the cost benefit of retiring (afforesting) marginal land, social impacts of change and ensuring the public private benefits are built into any incentive programme, and an assessment of possible impact on property values from policy intervention. The latter was explained on the premise that land is meant to be valued on its productive earning potential, i.e. what happens when that potential is compromised if production is capped?

## Farmer Visit and Feedback

### High Intensity Dairy Farms

#### Farm DBM 3

##### **1. Feedback on low leaching scenarios**

The farmer had already made changes on the farm and had brought leaching losses down to 36 kgN/ha based on a recent overseer review of the property. Generally the options presented in scenarios 1 and 2 were supported. Scenario 1 brought leaching down from 44kgN/ha leached to 38 kgN/ha leached. Scenario 2 brought it down further to 36kgN/ha leached and included the use of off farm winter grazing.

- The use of DCD was not supported on the basis that the science was not yet strong enough to demonstrate an economic return in the Waikato region. In scenario 2 there was also more cows grazed off for the winter than is practical with the winter milking operation on the farm.
- Effluent area was to be increased in the scenarios from 106 to 140 ha. The farmer has already increased the area to 150 ha. A key point was this increase was driven by a need to control Potassium levels more so than to reduce N levels. The farmer is actively seeking information on alternative approaches to managing the nutrient in effluent with covering 90% of the farm and solids separation being researched. Again this is being driven by a desire to maximize the return from the nutrient contained in the effluent more so than a need to reduce n loadings.
- Scenario 3, which brought leaching down to 26kgN/ha leached but required all cows to be wintered on the farm, is simply not a viable option in the farmer's viewpoint. Such a significant financial impact would bring into question the viability of the whole operation. The farmer pointed out the big range of debt servicing across the industry. When analysis is done on an operating profit and shows what appears to be a modest impact on operating

profit, it may render the business non viable because all the operating profit is required for debt servicing.

It should be noted this farm was already utilizing many of the N mitigation options such as very high per cow performance ( >500kgMS/cow) and diet manipulation to reduce average crude protein in the diet.

## **2. Feedback on more extension**

The farmer was supportive of any initiatives that keep the momentum of improving environmental management rolling. Projects such as this are valuable in developing understanding and building a better understanding of how changes will impact farmers.

- The farmer firmly believed there needed to be more emphasis on regional impacts as well as the on farm impacts. He expressed concern about the wider implications if dairy production across the Waikato was limited by 5 – 10%. The downstream consequences of reduced job numbers in local communities right through to the impact of reduced export earnings need to be factored in.
- This farm is somewhat unique in terms of the very high productivity and output. The farmer is comfortable to be involved in future work that helps develop understanding and new approaches to reducing environmental footprints.
- There also needs to be more publicity to farmers and the public about the improvements and progress that has been made over the years rather than the continual negative sentiment that prevails. Give credit where credit is due.

## **3. Direct results of the study on this farm**

This farmer has already made a number of changes to his farm system that have resulted in lower N losses. These include:

- Increasing the effluent disposal area by an additional 46ha so 150 ha can now be covered. It is envisaged this will be increased further.
- An awareness of the advantages of higher per cow production allowing a lower stocking rate is continually being exploited.
- Lowering the average crude protein of the diet was already a key feature of this system.

Often this change is driven by other economic drivers but the environmental opportunities they create are a useful additional outcome.

Effluent management and extracting the maximum return from the nutrients contained within it are key drivers of innovation on this farm.

Other technologies are going to need more robust science before they are adopted, generally they will also have to have an economic return as well as a positive impact on environmental measures.

Lack of clarity and certainty about rules and policy was also raised as an issue. The current discussion around pond sizes was given as an example. The feeling was farmers should be prudent and not make investments until the rules are finalized.

#### **4. Additional points raised**

It was clear the farmer had put a lot of thought into the issues surrounding this project. He would like to see an efficiency measure of N loss used such as kgN/kgMS. This is important from a regional and national economic perspective.

- For N loss per hectare the farm is currently leaching the industry average or less at 36 kgN/ha. However on a kgN/kgMS basis the farm is performing approx 50% better than the industry average as a consequence of much better per hectare performance.
- Dairying is always going to have some environmental impact but the farmer believes it makes sense to promote systems that can produce more productivity and ultimately more export earnings for the same impact. This was a very strongly held view
- The farmer made the point he is not only interested in N use efficiency but is also looking to use all resources more efficiently including water and energy.

#### **AD1 Farmer Visit and Feedback**

##### **1. Feedback on low leaching scenarios**

The farmer felt that there were good options presented in the lower leaching scenarios.

As a result of the study, he has taken on further consultancy advice to further improve efficiencies in the operation. This has included a strategic assessment of where the farm system is going, and how it can be more nutrient efficient. Considering better effluent management and also more nutrient efficient cropping strategies are a result of the exercise. In exploring better effluent management, he has hit a brick wall in terms of the technology available with regards to lining pumice ponds, and has suggested this is an area that needs further work for farmers like him. The expense of lining his pond is around \$100,000 and it is not a long term answer in his mind.

This exploration of new ideas and strategies is a positive result, and has been largely a result of the UWNES study being conducted with this farmer.

The farmer was already considering change, so the study has resulted in more use of fertilizer technologies and soil management practices, to improve the rate of change.

The farmer is keen to explore more about biological systems, and better soil management. He was already looking at ways to improve the health of his soil, as he was concerned about the high use of artificial fertilizers. As a result of the discussion, a field trip was organised for around ten Reporoa farmers to travel down to the Hawkes Bay to gain a better understanding of biological systems.

There was a little concern over lowering of stocking rate as in the lowest leaching scenario, but as long as profit was retained this was seen as acceptable.

## **2. Feedback on more extension**

The farmer indicated that more of an incentive based approach might be needed to facilitate change, rather than the command/control mechanism.

The farmer felt that *“there is a negative feeling towards the regional councils in their area, due to a feeling that farmers are being unfairly picked on, and fined, for minor offences”*. The farmer would like to see more of the following in operation:

- Technology improvement for better effluent storage and management. This would be long term liners for ponds on pumice country, as well as liners that will cope with heavy machinery on them if required.
- More technology from overseas bought in to NZ with regard to effluent management.
- A more stable political approach, eg the effluent pond vs sump debate was raised, and it was asked why there was a shift from ponds in the first place.
- Clear messages from the Councils along with clear Rules – so farmers can understand what is being asked for, and how it should be done. Interpretation of obscure “effects based rules” is something that farmers get confused by.
- Rules that are suited for soil type, rainfall, and land use would all be of benefit.

## **3. Direct results of the study on this farm**

This farmer has taken a number of direct actions as a result;

- He will take on a path to improve his effluent use, as a result of understanding the benefits of the effluent on his farm
- He is organizing a group of farmers to visit some established Biological farmers in the Hawkes Bay in order to gain more knowledge on the subject.
- Will move away from conventional cultivation techniques and the use of Brassicas, and move to more regrowth crops, that will make the best use of effluent in summer
- He is using less N, and will continue to do so wherever he can.
- He is looking at reducing P inputs where he can.
- Will keep researching the options to improve his effluent infrastructure.
- He has also indicated that he would be happy to have a focus farm on his property, should there be some good research, progress, and change that may be of use to the wider industry.

## AD2 Farmer Visit and Feedback

### **1. Feedback on low leaching scenarios**

This farmer involved in the study felt the scenarios presented for the lowest leaching example, for his farm, were unpalatable. Due to the high leaching nature of his soil, it was a challenging farm to lower leaching on, and the proposal of a lower stocking rate, with reduced production was really quite unacceptable in this instance.

He hoped that in future, there would be improvements in technology, to enhance high levels of productivity on farm, while managing nutrient loss.

His feedback was that we need more robust forms of measurement (overseer needs to be refined, and the modelling needs to improve its predictions and capabilities)

The main concern he had was moving from 3.4 cows to the Ha to 2.3 cows/Ha and still being able to manage the feed surplus into silage etc. The other concern, was that if there was lowered productivity from the property (in total MS) then his perception was that in future, that would devalue the asset as a whole. Farms are sold on productivity, profitability, and output. A constrained environment might mean that reduced output from some farms is mandatory. This is a real concern if productivity and cash flows cannot be maintained as a result.

The perception that asset values might be worth more in future, once the uncertainty is removed, and farmers have learnt to manage under constraints through better management and new innovation, is still of little consolation for this participant, who feels that it is going to be a “slow road” for change.

This farmer is not presently considering change to his system. He wants to see more convincing science, more reliable models, and farming as a community, within the district demonstrating the way forward. That is, “change led by farmers.” Like many farmers, he is sceptical about the application of models to real life farming systems.

### **2 Feedback on more extension**

This farmer was clear that partnerships would be the way forward for education of farmers. This might involve EW partnering with leading farmers and promoting best practices to all in the catchment.

- This could be in the form of focus farms, or in the area of promoting farmers who are already doing a good job. Either in demonstration days on farms, or via mail. Education and partnerships with good science, was clearly what this participant would like to see more of.
- For change to occur there will need to be better tools available to farmers to assist with the leaching reductions.



- Regulation is a concern. This is especially true as he felt there was still not enough good science around the measurement of the losses from farms.
- He also added that all farmers were a bit negative to the regional councils. He felt this was due to their regulatory role, and some of the assumptions and behaviour of councils in the past. However, he shares the view with other participants that all extension providers and regulatory authorities play an important role, and everyone needs to be involved. A framework for change will not work if there are not clear signals (such as incentives). He is not in favour of regulation.

The farmer would like to see more of the following in operation:

- Better education around how to adapt overseer for low clover pastures. This is a real concern, and has been raised several times. There is an impression that clover root weevil has diminished the ability of pastures to fix N. This is possibly an area that requires more research. There is no doubt, that some farms are showing evidence of less clover in the sward than others. We need to be definitive around the cause of this.
- More education on how to manage farms to feed cows better at slightly lower stocking rates, and not lose pasture quality at critical times of the year.
- This farmer argued that improvement of performance and branding of product would not result in any extra income to farmers. He believes there is no real case for this.
- This participant cited that a high level of motivation for him is that of “intergenerational transfer – and being a good custodian of the land.”
- Succession planning is something he is addressing at present, and as part of this, he is thinking about how he leaves his farm in better shape for the next generation. He felt that tapping into this motivator for some farmers will be the way to get them to listen.( he cited the 100 year club)
- We all agreed however that different messages will need to be tailored for different business operators. For the large farmers, the small family farmers, the equity partnerships, and the absentee owners etc. All will be motivated by different drivers. For some it will be the custodian factor, for others it will be entirely returns driven etc.
- In summary, to get change, it will be contingent upon tapping into what the motivating force for the farmer group is, to then “lead the thinking” of the owner, to change.

### **3 Direct results of the study on this farm**

This farmer has made no direct changes and has indicated that he will not be making any in the near future, however he will continue to try to arm himself with more knowledge around the subject.

- He is looking at reducing P inputs where he can, and more strategic fertilizing. He has an interest in the Dairy Push Farmer program and is keen to see more initiatives supported by EW to enhance research, demonstration farms, and novel approaches to the solution.

## Medium and Low Intensity Dairy Farms

### JA 1 Farmer Visit and Feedback

#### **1. Feedback on low leaching scenarios**

It was strongly suggested that farmers are reluctant to make changes with regard to infrastructure or management systems until they know “what the rules are”. A tangible example is the fact they are delaying their creation of an effluent storage pond until they know what size the pond needs to be.

Additionally they stated there is no incentive or penalty to reduce nitrogen leaching at present, as there are no rules in place. The farmer emphasized the point strongly that farmers need time for science to be developed to create robust mitigation strategies.

The farmer questioned the ability of the average farmer to increase per cow production levels to create better production efficiency, and thus financial profitability as well as reduced N leaching. He also questioned one of the scenarios we used which increased his production level per cow. However it was pointed out to the farmer that the increased per cow production level was associated with a larger cow live weight, and the ratio of kilogram milk solids to kilogram live weight had remained unchanged for their farm.

For this property all of the scenarios created resulted in a decrease in profitability, primarily due to the fact that the farm is already operating at a very efficient level.

#### **2. Feedback on more extension**

The farmers felt that they needed more information to make decisions upon, and are disappointed that the regional Council is unable to help them with regard to providing recommendations as to size and structure of effluent systems. They outlined that they would be happy with a consent type system which gave them certainty for future infrastructure development e.g. a 10 year time frame where a certain system is guaranteed to be compliant. They are already familiar with this concept, as this is how their irrigation consent is managed.

#### **3. Direct results of the study on this farm**

This farmer has made no direct changes as a result of the study. However it is likely that he will enlarge the effluent storage area when the “rules” are finalized, and intends using more maize grain-based supplement rather than palm kernel.

During the meeting the following areas were discussed as being relatively easy to implement and would have a positive impact on reducing N leaching

- Enlarging effluent area
- Reducing nitrogen use in May and June
- Reducing overall nitrogen usage
- Switching to different feed supplement types to enable better rumen function

- Increased storage application of effluent

It was pointed out to the farmer that his current effluent area of 12 ha was insufficient based on current production levels. The farm is already capable of spreading effluent to 25 ha, so the point was made to the farmer to use the other 13 ha that had not really been used at this stage. While the capital has been spent to increase the effluent area up to 25 ha, there is considerable extra labour input required to utilize it. Up to now, the benefits from using the nutrient more efficiently have not been perceived as great enough to justify the additional labour input. Following the follow up visit it is expected that the greater area will be utilized.

The farmers have undertaken significant riparian plantings on both the dairy farm and runoff. Although this obviously has benefits, it has limited benefit with regard to reducing nitrate leaching.

In summary it was made clear that the farmers are looking for rules and boundaries that they can understand and work with, to modify their infrastructure and management system in the future. However until these policies are clear there will be little change on the farm. The overriding issue for this farm is maintaining profitability. I suspect we have had some success with regard to encouraging the farmers to enlarge their effluent area, and consider reduced nitrogen applications, particularly in the winter.

#### [NW 1 Farmer Visit and Feedback](#)

##### **1 Feedback on low leaching scenarios**

The farmers were happy with the first 2 options which dropped the N leached to 27kgN/ha/yr and 26 kgN/ha/yr respectively, mainly through dropping stocking rate slightly, removing winter N application, and adjusting cultivation methods. Overall these were small changes to the system. The farmers were a bit sceptical about the drop in cow numbers and increase in per cow production although they understand the theory behind it.

However the 3<sup>rd</sup> scenario which shifted the nitrogen leaching to 26 kg N leached/ha without the use of winter grazing did concern them mainly due to the capital cost of the infrastructure and their ability to finance this option. It was also going away from where they wanted to be in terms of system intensity. They believed that once people start having to build feed-pads they will want to intensify to be able to pay for the infrastructure which will be counterproductive to reducing nitrogen leaching. They also thought that the cost of the infrastructure in the project was underestimated in this scenario particularly around the cost of upgrading the effluent system to cope with the additional effluent. Another area of concern for this sort of a system which has not been introduced in the report is the affect on animal health. Will having the cows standing off on a concrete feed pad throughout the winter lead to issues around lameness, mastitis and other animal health issues?

The main issues that they have around the project were as follows

- The cost of the effluent pond liner may be underestimated
- He was also concerned in the increase in per cow production following the drop in numbers

## **2 Feedback on more extension**

The farmers would like to see some practical information in this area - they do not just want to see theory. They would like to see some of these things implemented on-farm to see how the changes work and also how they impact on other areas of the business. There would need to be enough of these focus farms around the area so that they cover a range of soil types and system intensities so that they are applicable to their situation.

The farmer thinks that the best way to reduce nitrogen leaching in a sustainable manner is to manipulate the diet. He is interested to better understand how the feeding of high sugar grasses, chicory, plantain etc impact on nitrogen concentration in urine.

They also prefer the voluntary option to reducing environmental outputs as opposed to regulation.

## **3 Direct results of the study on this farm**

This farmer has taken action as a direct result of this study. Actions include:

- Running a small trial comparing the establishment and yield of direct drilling their turnip crop vs conventional cultivation. They have direct drilled half of a paddock and cultivated the other half and found no difference in crop yield.
- The farmer has been considering alternative fertiliser use as opposed to conventional fertilisers and has considered the Organic pathway as an option.

## **4 Additional points raised**

The farmer believed that the farm business should be taken as a whole and be able to use the runoff to his advantage in terms of spreading the nutrient leached over the entire property as opposed to looking at the effluent block in isolation

He also questioned why the sheep and beef farmers had a lower leaching allowance in comparison to the dairy farms

## **[NW 2 Farmer Visit and Feedback](#)**

### **1 Feedback on low leaching scenarios**

The first part of the meeting focused on reviewing the process used to create the farm scenarios, and then exploring these scenarios in more detail.

This farm differs from some of the other case studies in the following ways:

- This is a forestry conversion farm (two years out of forest). Using overseer this farm should be categorised as a developing farm. However for the purpose of this case study it was assumed that the farm was in a steady state scenario i.e. in a developed state. Thus some of the options raised for mitigation of nitrogen and phosphate were not immediately applicable to the farm, but it would be in the near future.

- This was the only farm in the study with a 50 : 50 sharemilker employed. This does change some of the dynamics with regard to expenditure.
- The farm is currently on the market (for sale). This has implications with regard to decisions made for capital expenditure on the farm.

Some of the key points from the scenarios that were emphasised as viable options to reduce nutrient loss included:

- **Create an additional effluent storage.** Currently the farm has very little effluent storage. With regard to enlarging effluent storage it is unlikely that this option will be undertaken in the short term given that the farm is up for sale.
- **Expansion of the effluent area.** There are gains to be had from expanding the effluent area from its current size. These are gains both with regard to minimising nutrient loss, and improving nutrient efficiency thus reducing fertiliser expenditure. The farm owner made the comment that if we can demonstrate good financial payback from expanding effluent area he would definitely consider this. The farm owner also commented that Environment Waikato should not be afraid to demonstrate benefits with regard to savings in potassium and phosphate and demonstrating the financial benefits.
- The sharemilker made the comment that further elimination of dirt piles would not only help to improve organic matter on some paddocks, but also make it easier to spread the effluent.
- We also discussed the benefits from **direct drilling** rather than cultivating paddocks, particularly with regard to reducing phosphate runoff. The farm owners could accept the benefits with regard to this.
- We discussed the opportunity to use a **chicory crop** rather than a winter crop, meaning that there would be multiple grazings rather than a concentrated grazing in the summer or winter period, which leads to high nitrate loss. The owner was less convinced of this option, as their current systems rely heavily on building up a good bank of winter feed using a cropping situation.
- We further discussed the fact that **winter grazing** off the property does lead to reductions in nitrate leaching, but is merely transferring the problem to another catchment.
- The final key point we discussed with regard to scenarios was **improving per cow production**. Currently production levels are below an optimal range of 0.8 kgMS/per kg live weight, and we discussed the financial benefits of running a more efficient system. A positive side effect of this is also a reduction in nutrient loss. Both the owner and sharemilker accepted this point, and would consider moderating the stocking rate to better suit to pasture growth profile for this property.

In summary the owner and sharemilker largely accepted that the scenarios were valid, although they did have some concerns over the ability for a chicory and annual ryegrass program to provide sufficient bank of winter feed for their system. Enlargement of effluent area, and moderating

stocking rate were options that were easily acceptable to them. Enlargement of effluent storage area was also an acceptable option, but unlikely to occur given that the farm is up for sale.

## **2 Feedback on more extension**

There were 3 specific comments made regarding future extension needs

- The farm owners wanted to ensure there was a level playing field i.e. the Regional Council recognize the fact that there are a large number of small farms that would struggle to be compliant with regard to their effluent systems, and larger corporate farmers should not be unfairly targeted.
- The farm owners reiterated the point that if the Regional Council is trying to encourage better nutrient efficiency it is critical that they can also demonstrate improved financial performance, as this creates a win:win scenario.
- The farm owners also made the comment that they felt there were too many parties offering contrasting or even conflicting advice with regard to nutrient efficiency e.g. fertiliser companies, Regional Councils, Dairy Companies, Dairy NZ, effluent pump installers, private consultants. They made the comment that there was a need for various parties to retreat into specific roles e.g. regulation, enforcement, advice, sales.

## **3 Direct results of the study on this farm**

There were no direct actions taken as a result of this study. The reason being this was a forestry to farm conversion, with a sharemilker that was actively being marketed for sale. There was not the imperative for change.

### **PG1 Farmer Visit and Feedback**

#### **1. Feedback on low leaching scenarios**

The farmer felt that there were good options presented in the lower leaching scenarios.

As a result of the study, he has been considering the best way for his farm system to develop, bearing in mind at some point in the future there might be some more accountability required around nutrient losses from farms

He has actively supported a new look “dairy push” programme for the area, which will look at farm systems that have a lower impact on the environment. This will have a strong focus on environmental and social performance. This is a good move he felt.

PG1 also has taken on board the thought of moving towards the lowest leaching scenario for his farm. He was grateful for the study ideas and interaction. He has suggested the low leaching model presented a good idea for his farm, as it presented an opportunity for it to be run by a single operator. With his plans being that he would like to step back in the future, this looked like a promising idea. The low leaching scenario: lower stocking rate system, a less intensive farm, and lower risk. He acknowledged a lower stocking rate may a bit more difficult to manage, but this could be overcome by education and more precise management at critical times.

The farmer was already considering change, so the study has resulted in an expansion of his effluent system to improve environmental outcomes. This farmer is active in community, and learning activities for other farmers. He recently hosted a dairy effluent field with Dairy NZ and Fonterra on his farm, with 70 farmers attending. This was really positive he felt, and the attitudes to better management of nutrient was changing. He will extend his effluent system from 12 ha to 20 ha for the next season. He also has elected to go away from crops, but does not rule out direct drilling of grass to grass, or alternatively summer regrowth crops under the effluent system.

## **2. Feedback on more extension**

The following points were made regarding ongoing extension efforts required

- There needed to be more education and leadership of other farmers.
- The only way to go might be to regulate the poorer performers, as they create a bad name for the industry as a whole, and they also use up valuable communal (Dairy co-operative) funds, in preventative work ( ie the Fonterra Effluent Advisory team).
- All farmers were a bit negative to the regional councils. He felt this was unwarranted. His view is that all extension providers and regulatory authorities play an important role, and everyone needs to be involved. A framework for change will not work if there are not clear signals, such as incentive (education)and command/control based regulatory mechanisms.
- Better education around how to adapt overseer for low clover pastures. He felt a lot of farmers felt the measuring of their farm's leaching was questionable.
- More education on how to manage farms to feed cows better at slightly lower stocking rates, and not lose pasture quality at critical times of the year.
- Seasonal volatility and risk – what system fits best?
- Farmers needed to have a better understanding of what the markets are asking for in future. He felt that a lot of farmers had not “moved with the times” in the past 5 years. They had followed capital gains over making good business decisions. This may have been a fault of the industry, as a whole, who showcased leaders as those who kept borrowing, and growing assets with the use of high debt. He felt this focus should change to responsible farm systems and a more consolidated approach to business. There was no focus on good business and environmental management.
- Farmers should be thinking about preparing their business for their exit. No one will want to buy or bank a non compliant farm. As farmers age, they should think about the saleability of their asset.

## **3. Direct results of the study on this farm**

This farmer has made direct changes to his system as a result of the study:

- Will move away from conventional cultivation techniques and the use of Brassicas, and move to more regrowth crops, that will make the best use of effluent in summer, or no crops at all.
- He will take on a path to improve his effluent use, as a result of understanding the benefits of the effluent on his farm
- He will keep thinking about setting his farm up as a one man operation – that is for 225-230 cows rather than the present 285 cows. This is in line with the low leaching scenario.
- He will look at improving pasture utilization with lower stocking rates.
- He is looking at reducing P inputs where he can, and more strategic fertilizing
- As a member of the Dairy Push Farmer group, he will look at being fully supportive of the education and process over the next three years to lift awareness in the catchment of lower leaching farm systems and improved public image for farmers.

### DMCD 1 Farmer Visit and Feedback

#### **1. Feedback on low leaching scenarios**

This farmer is a strong user of Overseer (has completed the SNM Course) and therefore understands the nutrient flows. Feedback points included:

- Question over whether the use of modelling tools (Farmax) truly shows the implications of lower pasture utilisation and higher residuals.
- The farmer still has a focus on profit and convenience – i.e. maize is not used on this system as it is too expensive to get to Taupo, requires more storage and requires more skill from the staff for feeding out.
- Are we (the dairy industry) just moving to a UK type system? Our advantage has always been utilising pasture – the high input system resulted in a 10% drop in pasture utilisation which had to be countered by the cost of imported feed – financially inefficient?
- The farmers' understanding was good, but his '*buy-in*' is limited.
- Farmers natural instincts will always turn to profitability?
- While the installation of a herd home and higher supplementation resulted in lower N leaching, it would be likely that the results would be that the farmer would “crank up” their supplementation even further to make this investment pay.
- Need to get a better understanding on the full implications of this type of changes in farm system intensity – feeding and financial is easy – dealing with more staff and social issues is not.



- There is still a feeling that farmers are “ramping up” their systems for fear of another “Taupo type” situation occurring – EW need to manage this
- Too much focus on getting cows off grass and feeding supplement to lower N losses. Getting away from the fundamentals of NZ agriculture – what other technology can we use
- Do we have a real understanding on the long term costs to operations from initiating nutrient restrictions?
- The approach that has been taken by EW is the right one by trying to gauge the implications on farms first.

## **2. Feedback on more extension**

- A need for better information / education on the actual water quality targets and the current levels – this is not well conveyed by EW.
- Farmers need to see the profitability first to get any buy in.
- Need more science focusing on these issues
- Analysis at a whole farm level needs to be able to pinpoint where the nutrient loss is occurring. It was suggested that newer versions of Overseer moving to monthly time steps should be able to show this.
- Need to have more readily available information on feed types to be used in a system that will provide nutrient benefit as well as profit benefit (i.e. low protein, high ME feeds).
- Need to be able to clearly show farmers the nutrient value (NPKS) of the feeds they are importing to ensure they are making sound decisions at fertiliser time.
- Need significantly more education around winter cropping / standoff areas / sacrifice paddocks and how this practice should be done.
- Need better education on how to best use the effluent that is created on farm – more analysis on the benefits of low application systems on pumice soils.
- Need more work by the industry on alternative crops to Swedes and Kale with a higher N uptake.
- Winter is the “danger period “ for N leaching but is also the biggest “cost” for feed in a winter cold environment – how can we get around this?

## **3. Additional points raised**

- We run the risk of making systems complicated and are driving the need for a completely different skill set in an industry that is already struggling for quality staff.
- The approach is right but still large hurdles to overcome

- Doesn't envy Ross' job!

## DBM 1 and DBM 2 Farmer Visit and Feedback

### **1. Feedback on low leaching scenarios**

DBM1 and DBM 2 are owned and managed by the same farming business. Regarding DBM 1, the stretch scenario 2 had been given some serious consideration. The biggest change in Scenario 2 involved a drop in what is already considered a low stocking rate from 2.6 to 2.4 cows per ha. While an increase in production had been factored into the scenario, it was not enough to make up for the drop in stocking rate and total production was expected to drop. After discussing it with the farmer, he was more confident that the cows could be managed so there would be a sufficient increase in per cow production to result in no drop in total production. The result would be cows producing 500 kgMS/ha. This is an important point as the option would not be considered viable if the production dropped as shown in the original scenario.

- The emphasis on increasing per cow production is as a desire to improve on farm efficiency and profitability. The positive environmental outcomes are a bonus rather than the driver.
- Looking for confirmation that DCD technology will have a positive economic outcome before it will be used.
- With regards to the organic operation scenario one which only involved a 3 kg /ha reduction in N losses was seen as feasible and largely implemented

There was a less positive response to the 2<sup>nd</sup> scenarios outlined. The original overseer file results were counter intuitive. The impact from the organic operation appeared to be higher than would have been thought. Also the range of interventions is significantly more limited. Ross has subsequently sent the file for review by AgResearch and they have identified a fix that goes some way to explaining the difficulties identified.

For DBM 2 Scenario 2 had a drop in production that would just not be considered economically viable or tolerated. The ability to reduce N imported in fertilizer is limited as most organic composts are animal waste derived and contain N. DCD technology would not be an option even if it is proven to be economically viable. Reducing stocking rate is one of the few tools available but it was questioned if the per cow production under an organic system could be increased enough to offset the reduced stocking rate.

### **2. Feedback on more extension**

The farmer had clearly given this area some considerable thought and generated a lot of discussion

- The momentum has to continue but with stronger links between the economic out comes on farm and the environmental impacts. The farmer felt that there was a tendency to look at the environmental impacts too much in isolation.
- The farmer would like to see the overseer reports redesigned with a simple 1 page inputs and outputs page developed.

- Increasing per cow production formed a significant part of the conversation. It is such a powerful tool in reducing environmental impacts as well as driving profitability. The number of farmers with the skill to achieve it is increasing but there are issues with the ability of many staff to actually achieve it.
- Programs such as Dairypush are going to be valuable in meeting the challenges. They will still need to focus on profitability first but put more emphasis on those technologies and practices that have the greatest positive impact on environmental measures.
- Providing farmers with certainty over the rules was seen as important. In 10 years farmers have been encouraged to do away with ponds and go to spray irrigation of effluent to it now appearing that storage ponds will once again be required. Farmers will not invest until they have certainty they are investing in technology that will future proof the business.

### **3. Direct results of the study on this farm**

The farmer has made changes to his system as a result of this study and is continuing to explore ways to further improve the efficiency of their system

- The farmer had upgraded the effluent sprayer with new equipment being delivered the day of the interview. Options discussed in the scenarios that increase profitability at the same time as reducing impact are being actively considered. Business strength remains a focus.
- Compost on the organics farm has shifted from goat compost to chicken compost so more pasture can be grown without applying too much N on the organic farm.
- A continual drive to maintain production but from fewer cows is a feature of this farming operation. He is following up and using the Farmax program to better understand the implications of reducing stocking rate further

This farmer has a strong awareness and much greater appreciation of the issues than most farmers. Few decisions are made that don't factor in the environmental impact as well as the economic impact

### **4. Additional points raised**

Again thought had clearly gone into these issues and how they may help or hinder progress towards a goal of less N leaching.

- Would like to see greater uniformity in interpretation of soil nutrient data. Balance, Ravensdown and Summit all have interactions with the farm and the frontline team are all capable and professional individuals however given the same set of information they would come back with 3 quite different recommendations to soil nutrient management. This can lead to confusion and will slow the rate of farmer understanding and confidence in solutions. Similar issues with consultants. Does an organization like DairyNZ need to take a leadership role in addressing the skill level

- Would like to see more work into groundwater nitrate flows and for more comprehensive mapping of ground water changes developed.
- Concern raised about the rather crude approach to the clover inputs going into overseer. He observes significant annual variations in clover populations in his paddocks on both the conventional and organic property. Farmers will have to respond to that with adjusting N inputs while in most overseer files the default clover content setting is used.
- There was a brief discussion about the need to consider other nutrients such as phosphate as this may be easier to manage but ultimately have a greater positive impact if some of our water ways are phosphate limited. This spoke to the need for more science to inform policy.

## Sheep and Beef Farms

### DMCSB 1 Farmer Visit and Feedback

#### **1. Feedback on low leaching scenarios**

The farmer has an involvement in a farm within the Lake Taupo catchment and as such has had first hand exposure to this issue. From this he is also very familiar with and Overseer and uses the program himself. He is also aware of how Farmax works and recognises the power of it as a modelling tool for establishing best fit systems.

Due to the above the understanding of the analysis was good. He felt initial “easy” scenario figures were realistic changes and that a number of these have already been adopted. It was pointed out these changes have been driven more by profitability of various stock classes but the outcome is still positive in terms of reducing N leaching.

However the scenario to reduce N leaching to the very low levels was not supported. The option of a 30% reduction in stocking rate and significant silage sales are not practical for the operation and there would be a need to look at other mitigation strategies / technologies before this was undertaken.

The study had the effect of making the farmer question the relative fairness of different N leaching loss targets for dairy farmers and sheep & beef farmers.

In terms of the process used in the project, the farmer felt it would have been more helpful to both themselves and the consultants if the Overseer reports and the Farmax report were completed by the same person and at the same time.

There was also a sense that the sheep & beef farmers were being unfairly targeted in the study. If there are nutrient loss targets, then the dairy farms are starting from a higher level and it is easier to remove 1kg N from a dairy system than a sheep & beef system, whilst minimizing the impact on profitability. This was seen as an extra hurdle for sheep & beef farmers to achieve when they were already having a lower impact.

Dairy farming was felt to have intensified production systems more aggressively than sheep & beef farmers in recent years and were not being asked to “unwind” these more intensive systems as aggressively.

## **2. Feedback on more extension**

The farmer had some very constructive comments with regard to future extension needs. The fact this study went through to whole farm profitability was seen as a big step forward. Farmers need to see the profitability implications at a whole farm level before they will commit to any change. Most (all) farmers see themselves as good stewards of the land but they need to be able to make a profit first and foremost.

The use of a monitor farm type concept to demonstrate mitigation strategies in more detail was suggested as a way improving acceptance among the wider farming community. Monitor farms could also help in improving the understanding of profitable and efficient nitrogen use on sheep & beef farms. Farmers need to get a better understanding of the nutrient benefits of improving on farm productivity as well as the financial benefits that have been well proven (i.e. grow stock quicker to higher weights and get them off the farm sooner).

The farmer was also interested to look at more detailed Land use capability work on their farm to establish true profitability of the various land classes. The comment was also made that there is still a need for further training of farmers in the science behind overseer. "Nutrient flows, leaching and runoff" are, for a great number of farmers, very new terms that they do not fully understand. *"This lack of understanding can create fear of the unknown"*.

To help with this it was felt farmers within the catchment should have access to a farm consultant to enable Overseer and Farmax scenarios to be run on each farm.

## **3. Direct results of the study on the farm**

Changes involving stock policy as included in the scenario have been implemented. These changes were driven by favourable economic outcomes more than the direct reduction in N losses.

## **4. Additional points raised**

The farmer would like to see more work looking at the cost/benefit of retirement of land. He thought 5% of his farm could be retired and planted without significant impact on overall profitability.

The farmer had a question of *"who pays for the cleanup of the rivers?"* He thought there was a need to have a better understanding of the full social implications of change, not just the direct implications for the farmer.

The farmer also had concerns around the potential drop in land value if nitrogen leaching limits were to be imposed on his property. In this case the deer farm is surrounded by dairy farms and the *"value"* that it has is based on future conversion. This value could be reduced if the property was restricted to a nitrogen leaching limit of 12 kgN/ha/yr.

### **[SL 1 and SL 2 Farmer Visit and Feedback](#)**

#### **1. Feedback on low leaching scenarios**

Whilst this was a combined meeting, the farms had different mitigation options.

Some of the mitigation options for low leaching scenarios involved managing various stock classes on different types of land. Farmax is unable to model the benefits of this unless each portion of the farm is separated and stock flow between blocks is monitored.

The farmers felt that more interaction between the farmer, the fertiliser company who prepared the Overseer report, and AgFirst who prepared the Farmax model, in deriving the initial nutrient management plans and mitigation options may have improved the overall outcome. It was felt to have the overseer file prepared by one person and the Farmax file prepared by another created a disruption that would best be avoided.

### **SL1**

This farm scenario was slightly different in that this was the first year this farmer was farming the land in his own right. Additionally the base Overseer plan was already only leaching 12 kg N/ha/yr, hence there were no strong drivers to change farm policy or practices to reduce N leaching.

The farmer was happy with his current farming system, with the use of a winter crop to match feed demand. There was a clear separation with sheep grazing the steeper country and cattle being farmed more intensively on the flatter land. At this stage half of the farm was reticulated, with the other half natural water. Most of the main riparian areas are already protected.

### **SL2**

The drought has impacted on the implementation of some of the management options presented in the scenarios. Traditionally Nitrogen fertiliser is used in both April and August. The revised strategy was to use this only once a year on the more intensive area. This has not materialized at this stage due to a drought, after which Nitrogen fertiliser was blanket applied over the farm to boost pasture growth, with no base fertiliser.

The revised strategy also ran fewer large cattle over the winter. The farmer has partially made this change in his farming operation. Also less stock were purchased than originally planned due to the impacts of the drought. This highlights the need to be flexible with stock policies to enable selling if required due to natural climatic events.

The revised strategy also included a summer crop to finish animals, but this had not been implemented at this stage, partly due to financial constraints. A summer/autumn crop takes away some of the risk but there is an establishment risk in the farmers eyes.

### **Combined**

Both farmers considered the use of Lucerne to provide more drought protection, but this has not been adopted at this stage. A number of hurdles were expressed that were seen as limitations to its uptake. Cultivation can be an issue with loss of Phosphate, depending on type of cultivation or no-tillage used. Invasion of weeds at cultivation time can also be an issue.

Thinking about the farm in terms of land use capability was suggested as important in terms of making some of the changes put forward in the scenarios.

Managing the easier contour country which grows the best grass, is able to be regrassed, has better subdivision and water and can be more effectively grazed more intensively, while managing the non tractor country less intensively could help reduce overall nitrogen leaching.

With regard to Wetland protection, single wire fencing for the removal of cattle was seen as a priority with the removal of sheep access seen as lower importance. There was discussion around the need to graze these areas in time of dry to remove the nutrient build-up.

## **2. Feedback on more extension**

A number of positive suggestions were put forward by the farmers.

- Monitor farms representing the more common sheep & beef policies was seen as helpful in terms of getting farmer engagement and understanding of the issues. It was thought that a range of farm types were suggested as being helpful in this process including:
  - Sheep & Beef (50:50 or 60:40)
  - Sheep & Beef (30:70), including bull finishing and dairy grazing
  - 100% dairy heifer grazing
  - A deer operation because of the need to understand the impact of the increased soil erosion risk of this stock class.
- Understanding of Science. It was felt that the general level of understanding about Nitrogen use was lower in the sheep & beef farming community. The recent dry autumns had seen increased nitrogen use to boost autumn pasture growth rates, but the impact on profitability and on the risk of nitrate leaching was not well understood.
- Nutrient Caps. The concept of nutrient caps has been accepted by these farmers, but certainly not by all in the farming community. The view was the information had been made available to understand the concept but that not all had taken the opportunity to become acquainted with it.
- Impact. There was a feeling sheep and beef farmers are not making a big impact at present (with regard to nutrient management). The sector can't be ignored, but the farmers felt the issue was not as big an issue as the dairy sector.
- Water Quality. Promotion of improved water quality for stock to achieve improved performance was put forward as a means of minimizing the impact on profitability. Improved stock water on better quality country could make up for losses incurred in the retirement of poorer class land in terms of profitability.
- Training. The use of short courses and seminars to improve farmer understanding was discussed. To improve uptake with regard to attendance, ideas such as a rates rebate, and holding courses within the local community were mooted.

## **3. Additional points raised**

Both farmers provided feedback that they felt the inclusion of sheep and beef farmers in the analysis process was a token gesture. In particular, the farmer meeting in Putaruru was felt to be strongly biased towards dairy farmers. It was felt that the range in dry stock farming operations was not well understood, and that if the intent is to really understand the impact on the sector

of nitrogen leaching caps then a wider range of farm systems should be included. Because of the different issues facing sheep & beef and dairy farmers future meetings may need to have time when the audience is split into sector groups.

During the course of these follow up meetings the use of Land and Environment Plan (LEP) (Beef and Lamb) was explained as no-one in the group really understood them. The opportunity to use the concept more widely, eg through integration into Monitor Farms, eg

- Level 1 – understand land resource
- Level 2 – land use capability
- Level 3 – soil consultant for soil mapping

The comment was made that existing demonstration farms or monitor farms could be useful to demonstrate and share the information gained from this project. It was also suggested as a practical way to bring Beef and Lamb into these wider environmental discussions

Concern was raised by the farmers with the concept of 'consent to farm'. The farmers were not sure if it affected sheep and beef farmers in the same way as dairy farmers. The farmers were seeking clearer understanding of this issue.