

Wise Use of N-Fertiliser on Hill Country Pastures

WiseN Up!

Global Forces Shaping Farming Futures

Dr Morgan Williams, Parliamentary Commissioner for the Environment, presented some sobering information at the Castlepoint Wise Nitrogen Use field day on May 15th.

His address left those present at the day more conscious of the need to provide and encourage a sustainable environment for future generations.

Some of the messages from his talk were:

- Fresh water is one of the world's vital resources. By 2025, 66% of the world's population will be facing fresh water shortages and/or pollution
- Worldwide soil losses continue to grow – 33% of USA's original topsoil has gone
- There is widespread loss of organic matter and extensive mining of ground waters

Special points of interest:

- Visit www.wisenuse.co.nz for further information and resources on nitrogen use.
- FAQs 8 & 9 are now available. Contact your facilitator or see the website for copies.

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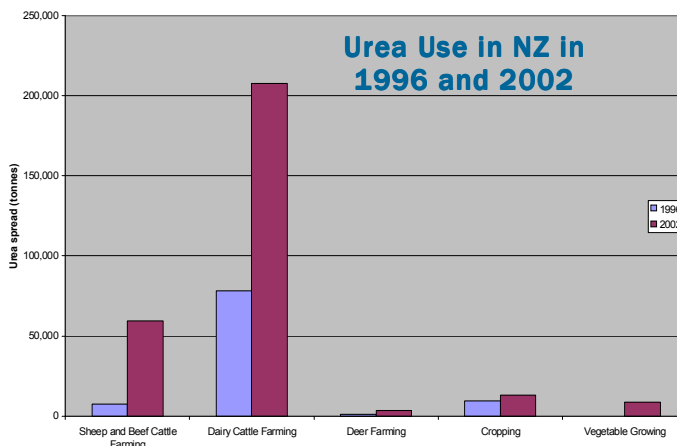
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- Salination from clearance & irrigation is occurring worldwide as is nutrient enrichment of surface, ground and coastal waters
- There is a decline in the genetic diversity of the world's food species.

While Morgan's talk covered general environmental issues worldwide, he also made specific mention of the environmental impacts of nitrogen on the NZ farming environment.

Pressure on Our Natural Resources is Increasing

Morgan also showed that NZ is following world trends of increased food production but with associated stresses being placed on our natural capital. This included the fact that over the last decade production of venison is up 38%, wine up 66%, milksolids up 50% and lambing %'s on intensive farms are up 11-19%, which he said was a great effort by



NZ farmers.

One of the 'fuels' of these productivity gains is manufactured nitrogen, the use of which is increasing significantly in the pastoral sector (see graph 1 above).

As production systems intensify, agriculture contributes appreciably to the estimated yearly nitrogen loadings to NZ surface waters - despite good management of point pollution on most farms (see graph 2 below).

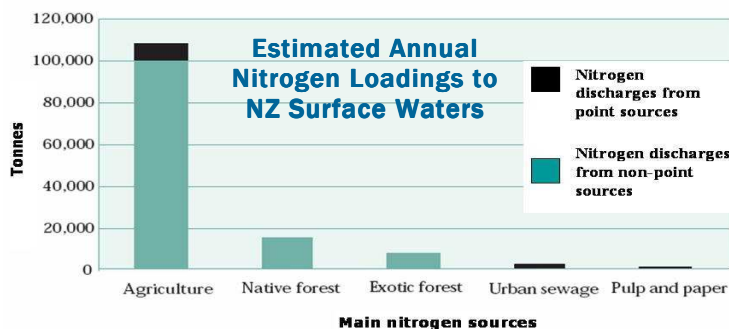
Morgan also showed that it can take a long time for nutrients to pass through ground water. Water from five springs and seven wells in the

western Rotorua & northern Okareka catchments were age dated in 2004. Eight of the twelve samples were shown to be relatively old with a mean residence time of sixty years.

This reinforced the fact that the full impacts of recent land uses changes, stocking rates, and fertiliser use may not be seen for many years.

Despite these challenges he stressed that there is great potential to reduce nutrient losses from pastoral systems and enhance production.

For a copy of the full presentation, see the project website at www.wisenuse.co.nz.



Overview From the Project Manager



The Wise N Use programme is now in its third year. Currently the 2006 focus farm demonstrations are underway, on a reduced number of farms as we have had a few changes in monitor farms (as part of the normal monitor farm cycle) and have decided in some cases not to start up a new Wise N focus farm just for one year.

The 2006 annual conference in Palmerston North in March, which presented results from the 2005 demonstrations, put a slightly different complexion on the economics of fertiliser N use in hill country compared with the previous year. The value of lamb and beef was a little lower than in 2004, plus the cost of nitrogen was a little higher. This meant that the economic optimum for N use occurred at lower application rates in 2005 for most focus farms. This is hardly surprising, and reinforces the need for farmers to carefully analyse where feed gaps occur within their farm system when contemplating N use so as to ensure maximum efficiency of feed utilisation, and to identify where the economic optimum lies before making decisions on how much N to apply and when.

Interest in the environmental implications of N use has steadily risen throughout the life of the programme, both in the public arena (spurred in part by ongoing publicity about water quality and greenhouse gas issues) and also amongst farmers who are keen to ensure fertiliser N is used in a wise fashion without incurring unforeseen costs in terms of sustainability of their systems and impact on the wider environment. There is little doubt that individual farmers

have a wide range of views on fertiliser N use, ranging from committed users to those who will never use it as a matter of principle. This range of opinion is to be expected – we also see a range of opinion on the usefulness of formal feed budgeting, pasture renewal and cross-breeding sheep. Diversity of opinion is healthy.

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Sustainable Farming Fund, 2006

The programme was reviewed earlier in the year by one of the major funders and in general came up smelling of roses. To quote: “In recent years, considerable controversy has arisen around the use of nitrogen fertilisers. With a nationwide network of focus farms and on-farm demonstration trials, the current project is well placed to play an important role in addressing some of the issues by contributing the state of knowledge on the wise use of nitrogen fertilisers in hill country situations”.

The focus farm component is scheduled to finish next year, so once this year's demonstrations are complete we'll aim at the National Conference in early 2007 being the final major event, along with presentations at the focus farm field days as appropriate. The N fertiliser rate trials measuring N leaching at Ballantrae, Invermay and Castle Point will continue for one additional year, so we'll have 3 years of leaching data by the end of 2007.

There has been a bit of media coverage recently about the possible effects of N fertiliser use on ewe and lamb health. Some of the comments were taken a little out of context by the reporter, however as a result of this publicity we will review available evidence and produce a fact sheet later in the year to fill you in on this topic. Certainly, from first principles it seems unlikely that pasture boosted by low rates of N fertiliser would have a significant effect on ewe and lamb health, as the N in urea is in the same form as urine N which is voided on pasture by grazing animals. Nitrogen is taken up by plants from the soil in the form of ammonium and nitrate, and by far the major source of these in hill pastures is from soil organic matter mineralisation and urine, rather than fertiliser. However, it will be interesting to see what the review turns up.

We are starting to assess how we might extend the results from the Wise N programme to a wider audience. We feel that very valuable information and experiences are being captured both from the focus farm demonstrations and trial sites and that it would be helpful to extend these more widely. More on that in due course.

You are most welcome to send any comments you have on issues around N use in hill country, or the Wise N use programme to us; e-mail is easiest for us at cmjconsulting@xtra.co.nz or phone/fax 06 324 7033.

I hope the spring/summer season brings you clement weather, healthy stock and excellent lamb and beef prices.

A Word From Ballance Agri-Nutrients

Ballance Agri-Nutrients is one of NZ's largest fertiliser manufacturers. The co-operative is 100% farmer owned and is a supporter of environmental initiatives via sponsorship of the Farm Environment Awards. Ballance also have a significant investment in training of technical sales staff in Nutrient Budgeting and Nutrient Management and advocating the use of the

Fertiliser Code of Practice, as well as the Spreadmark code.

Ballance Agri-Nutrients are one of the key supporters of the Wise Use of N project at two levels. Firstly via their membership with FertResearch (and the funding provided through them), and secondly via Ballance's own direct funding of the on-farm project.

The Wise N project is a critical one for Ballance as it will begin to address the concerns relating to increased use of N on hill country. At present the industry can only guess at the impacts. This project is needed to evaluate what potential impact farm practice may have, and then foster the development of best practice.

Focus Farm Feature

Western Southland Community Group



Farm Profile

The Western Southland Monitor Farm has recently changed properties and is now on a property in the Thornbury district. Because of this, the previous monitor farmers, Russell & Janeen Drummond from Avondale have agreed to continue for another year in the Wise Use Of Nitrogen Project.

The Drummond property is 1380ha (1310ha effective) of which 310ha consists of over-sown tussock country and is situated halfway

between Winton and Mossburn. Olsen P levels range from 20 to 45 with a pH of around 5.9. Annual rainfall is 1000mm and this is normally evenly spread throughout the year.

The property currently farms 9000 breeding ewes, and lambing is due to start in mid September (132% weaning expected) with a further 2800 ewe hoggets being carried through the winter of which a 65% lambing

is expected. Ewes are generally weaned in the first week of January with all surplus lambs sold in finished condition at an average carcass weight of at least 17.0kgs. Average slaughter date is the 5th March.

Russell & Janeen also run 180 breeding cattle, finishing all cattle bred on the property and in good seasons purchase extra cattle for finishing.

What Happened in 2005 and What Was Learnt?

A comparative trial was set up to evaluate application rates, and the timing of the applications. The key objectives of the Nitrogen applications were to reduce the winter supplements required for cattle grazing on the tussock blocks over the winter months, and to improve ewe weights and lamb weaning weights.

Four different blocks were used: a). A control block, b). Block with 100kg/N/ha in autumn, c). Block with 50kg/N/ha in the autumn and a further 50kg/N/ha in the spring, and d). Block with a spring application only of 50kg/N/ha.

The objective was to maintain pasture covers from lambing through to weaning at a level of around 1200kg DM/ha in each block. For this property the 100kg/N/ha applied in au-

tumn exceeded expectations, and outperformed the other applications that were trialled. Not only was the overall stocking rate higher (7.5/ha in the control, compared to 13.4/ha for the 100kg/N block) but stock production per head was also at a higher level.

The major area of learning was that there will be extra feed grown, and this may well be more than originally anticipated. Because of this the stock management plan needs to be flexible, so that feed grown can be fully utilised.

Ewe death rates on the different nitrogen trial blocks were recorded and had a surprising outcome. Each block except the 100kg/N/ha block had a ewe death rate of around 7%,

whereas the 100kg/N/ha autumn applied block had a death rate of 2%.

From the extra stock carried on the 100kg/N/ha autumn sown block it was calculated that an extra four tonne of feed per hectare was utilised. This means that the response rate to the nitrogen may have been as high as 40 to 1. However, it is felt that due to the autumn nitrogen application pasture quality has been improved. The spring growth produced a better tillering of ryegrass, the extra stock carried will have increased the amount of recycled nitrogen, and also there will have been a higher carbon to nitrogen ratio, which will all have had impact in creating a high estimated response rate.

2006 Nitrogen Demonstration

The focus for this season is to establish the repeatability of last year's results. With this thought in mind, we have only the one autumn application of 100kg/N/ha, but we will be monitoring the results of this application over three different areas.

We also hope to evaluate stocking rates and production levels on the areas which had

nitrogen applied last season in an effort to understand what long-term effects there may be from applying nitrogen. This is because the nitrogen applied last season is still having a positive impact on pasture quality 12 months since being applied.

Environment Southland has become involved this year, and has taken water samples from

the localised creeks. Water samples have been taken prior to, and after the nitrogen application.

From a farming perspective, the community group are still keen to further evaluate the financial returns from nitrogen applications on tussock country, and being mindful of the potential environmental issues.

For further information, contact:

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A Review of the Key Project Messages

- It would be irresponsible not to investigate the potential nitrogen fertiliser offers, and equally irresponsible to proceed without fully understanding the environmental effects. This includes investigating the changes that need to be made to farm management systems to utilise the benefits of nitrogen and will consider the potential environmental implications of proceeding.
- The potential to significantly increase hill country production and profitability through the use of nitrogen fertiliser is common knowledge. This research will encourage the adoption of wise nitrogen fertiliser use.
- Advice to hill country farmers is that any change to current fertiliser use should always be based on best management practices coupled with sound advice and a consideration of both economic and environmental aspects.

Visit The Project Website Today

www.wisenuse.co.nz

Website Update

The website for the Wise Use of N Fertiliser on Hill Country project was launched in February and contains a large amount of information on the project as well as data on general nitrogen issues related to the NZ farming environment.

A recent communication survey indicated that the website was being used only occasionally by farmers. This was predominantly due to slow internet connection speeds in rural areas.

During development of the site, rurally based members the project Steering Committee tested the site and found it reasonably user friendly and accessible.

If you have tried to use the site and have had problems, please let us know. If you haven't tried to access the site and have a spare few minutes one evening, jump on and let us know how you go.

Some of the information found on the site includes:

- Summaries of the 11 on-farm nitrogen demonstrations - results from previous years and demo plans for 2006
- A summary of and results from the Ballantrae and Invermay trials
- Project newsletters and Frequently Asked Question sheets
- A nitrogen Best Management Practice checklist
- Copies of press releases on the project
- The conference booklets
- Profiles of the team members involved in the project

The site brings together a large amount of previously disparate information on nitrogen issues. Visit the site today.



AGRESEARCH SCIENTIST PROFILE: Rex Webby

Rex has spent nearly 40 years as a researcher in the 'outdoor laboratory' carrying out applied research. His time in research has included about 20 years working on large scale farm systems experiments that covered the soil, the pasture and the animal. This work has involved analysing the complex interactions that occur in a farm system.

Rex is an acknowledged expert in the use of Stockpol and has developed a number of farm systems analytical tools. Moving from experi-

mental farmlets to whole farm systems and working with farmers was a natural progression for Rex who has worked extensively with farmer groups throughout the country. One of the challenges he has enjoyed over the years is putting theory into practice and adapting science and technology into something that will be useful and profitable to the farmer.

Rex sees the Wise Use of Nitrogen project as one where he can apply his farm systems experience and pass on his knowledge of soil,

plant and animal interactions. Rex says,

"The strategic use of N can improve efficiencies with flow on benefits to pasture utilisation and quality leading to higher animal performance. However this must be balanced with the environmental consequences of N use which remains a relatively 'grey' area in hill country farming"

Rex is based at AgResearch Ruakura in Hamilton.



The Project Team again wishes to acknowledge the funders:

