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About the newsletter

This newsletter is distributed bimonthly, and circulated electronically via email. We aim to include exciting and inspiring works that are being done nationally in the dairy on-farm NRM area. A copy of the newsletter can also be found on the Dairying for Tomorrow website http://www.dairyingfortomorrow.com.au

We hope you enjoy it, and feel free to circulate to any interested parties. Future contributions are most welcome and can be emailed to us - contact details at end of the newsletter.

Improving Nitrogen Use Efficiency

Caring for our Country funding is being used to investigate the adaptation of common broad acre precision farming technology into intensively grazed pasture systems. Using the concept derived by New Zealand based agricultural innovator Craige McKenzie, a joint project between Western Dairy in WA and the Tasmanian Institute of Agricultural (TIA) will ground truth the validity of the “Smart N” system.

The Smart N system uses Weedseeker technology to strategically apply liquid nitrogen (N) to intensively grazed pastures. The system works in the reverse to a weedseeker boom on a broadacre farm which only turns on the spray nozzle when a green weed is detected. In “Smart N” mode, the weedseeker sensors
are reverse engineered so that they are on the majority of the time, and when a high N / high biomass patch of pasture is detected by the NDVI sensor on the weedseeker unit, the nozzle is turned off.

In intensively grazed dairy pastures, up to 30% of the paddock area has been measured as high N patches from the previous 2-3 grazings. These patches which are the result of urine deposits, generally contain 800-1000 kg/N/ha, and as a result are not responsive to any N applied at commercially used rates. With up to 30% of the paddock potentially not requiring N, the opportunity exists to reduce N applications, but until this concept was developed in New Zealand, there was no practical way of actually applying N between the urine patches.

While the concept has been demonstrated on a small scale, this project aims to validate the use over larger areas, and to discover any pitfalls in the practical adoption of this technology. “There are still many unanswered questions that need to be resolved” said James Hills, the project leader on the Tasmanian side of the project. “We are still unsure of the sensitivity of the weedseeker sensors, and if they will pick one, two or three grazing rotations worth of urine patches. We would also like to determine how soon after a urine patch is deposited before it will be detected.”

Small scale calibration and validation trials are about to begin at the TIA Dairy Research Facility at Elliott in North West Tasmania to help answer some of these questions. Urine samples will be applied in strips in a paddock which has been recently cut for silage to ensure that there will be no recent urine patches from grazing animals. “We will be testing the small boom at different sensitivity settings across these strips every couple of days to see when and what is registering” James said.

Once the most appropriate calibrations have been determined using the small scale boom, larger demonstrations will begin. Two 6m demonstration boomsprays will be set up with weedseeker sensors and these will be used to run demonstrations on 4 paddocks in Tasmania and 3 in Western Australia. Total pasture biomass will be measured at all locations, with the assumption being that there is no significant difference in the level of pasture production between conventionally fertilised treatments (blanket N applied) and those fertilised with the reduced amount of N.

Reducing the amount of N applied not only provides the farmer with the opportunity for lower fertiliser input costs, but there is also the benefit of less leaching or volatilising of N into the environment. Reduced N concentration in the pasture will also lead to reduce greenhouse gas emissions from animals grazing the pastures, which is one of the main aims of the project.

Another application for the technology is to use the weedseekers in their conventional configuration to apply nitrification inhibitors to only the N rich urine patches to reduce the loss of nitrate N to the environment from these areas. This concept will not be investigated within the scope of this project but has potential for future application. Nitrification inhibitors such as DCD have been too expensive to apply to dairy pastures in the past, but with this technology allowing applications to be targeted to only the high N zones within the paddock, the cost of inhibitors would be significantly reduced.

The project will run demonstrations over the next two summers on irrigated pastures, with at least 3 grazing rotations having N applied using this technology. To view a short video of the “Smart N” concept, follow this youtube link, http://www.youtube.com/watch?v=bYpA0gQG5CI

Further information WA – Sam Taylor, 0429 332 593
Tasmania – James Hills, 0409 227 874

**Fertiliser Efficiency Research the Focus at QLD Field Days**

The fertiliser use efficiency field days held at Cedar Pocket, near Gympie, and Ravenshoe in September attracted over 40 people who were keen to find out about the latest fertiliser research on irrigated dairy pastures. This research is being conducted by the Queensland University of Technology (QUT) and James Cook University (JCU), as part of the Qld Dairy Industry’s Reef Rescue R&D project.

Dairy farmers, farm advisors, fertiliser suppliers, researchers and catchment management staff made up a diverse group interested in what happens to fertiliser once it is applied to the paddock, and how much of it is converted to pasture.
Dr David Rowlings (QUT), said “To ensure the research is highly relevant to dairy farmers, the fertiliser treatments have been designed to mimic average commercial irrigated ryegrass-kikuyu pasture rotations used in the tropics and sub-tropics”.

“Urea is broadcast at rates of 50 kg/ha and 98 kg/ha (23 kg/ha and 45 kg/ha of Nitrogen) every 3 weeks following grazing. Treatments include standard urea, Entec-coated urea, and zero urea as a control. An initial application of DAP (Diammonium Phosphate) was applied to all treatments at a rate of 100 kg/ha”, said Dr Rowlings.

“To get a good understanding of the soil profile across each site, deep soil cores were taken and analysed for nutrients, including the amount of the naturally occurring isotope $^{15}$N which is added as $^{15}$N labelled fertiliser to trace N movement through the soil and plants” said Dr Rowlings.

Researchers explained a range of automated instruments that have been set up on site to measure leaching, runoff and gaseous emissions on a regular basis.

Dr Rowlings said “Pasture yields are also measured from grazing exclusion cages approximately every 3 weeks to coincide with the grazings”.

Researchers are measuring fertiliser movement and looking at the effectiveness of a nitrification inhibitor (Entec) as a way of reducing soil nitrate losses through leaching and gaseous emissions.

Dr Rowlings said “Nitrification inhibitors work by stabilising the fertiliser applied in the ammonium form, and reducing the size of the nitrate pool for a number of weeks. The process gives the plant more time to take up both ammonium and nitrate ions, which means more fertiliser is available and used by the pasture”.

Researchers from the James Cook University, Dr Paul Nelson and Mr Jack Koci, have measured higher pasture yields from the Entec urea treatments over 3 consecutive pasture cuts at Ravenshoe, but cautioned farmers that it was too early to draw any conclusions yet.

Very early results from Ravenshoe show a pasture yield benefit from using Entec treated urea. Measurements will be continued over the next year to check this trend.

A full report, including the cost-benefits of Entec urea, will be available in August-September 2013. Senior Farm Services Officer for Lion, Howard Smith, said “The results will be useful to dairy farmers and it would be good to see it continue for another two to three years”.

The project coordinator, Rick Kowitz, said “There are many people to thank for the research, but it would not be possible without the generous support from the farm hosts, Rod and Ruvé Thefs and the Ravenshoe State High School.

The research is part of the Dairying Better ‘n Better program which is a partnership between Queensland Dairyfarmers’ Organisation, Subtropical Dairy and Dairy Australia. It is funded by the Australian Government’s Caring for Our Country Reef Rescue Program, and Incitec Pivot Fertilisers Limited.

For more information, contact the Queensland Dairyfarmers’ Organisation, 07 3236 2955.

Dairy NRM update: Tasmania

After a somewhat erratic spring in Tasmania, things are now in full swing with silage, Artificial Insemination and irrigation.

- In mid-November, NRM North and Fonterra assisted with "Better Effluent Management" field days run by Scott McDonald from DPI Victoria. Despite it being such a busy time of the year, over 80 people
attend. From January 2013, Tasmanian Dairy Industry Authority licensing inspections will also include effluent systems so farmers are looking to make sure their effluent systems are compliant with legislation.

- There has been strong interest from farmers to have **dairy shed energy assessments** as part of Smarter Energy Use in Dairies project, this includes dairy farmers on King Island.
- Dairy farmers in the Brid and Meander catchments are participating in a **nutrient management planning** project funding by NRM North - soil testing on 20 farms is underway.
- Also in the NRM North region, dairy farmers with **property management plans** are being assisted with **biodiversity incentives** for riparian fencing, water troughs and revegetation. NRM North support is helping to achieve some win-win outcomes for both the environment and farm profitability.

The Dairy Australia NRM coordinator for Gippsland was addressing the Climate Change Research Strategy for Primary Industry conference held at the Melbourne Cricket Ground in late November. Her presentation about farmer-to-farmer learning, focussed on the Dairy Australia/DAFF partnership project **Mitigation and Adaptation in the Australian Dairy Industry** (MAADI), designed to demonstrate the changes being made on Australian dairy farms to adapt to the changing climate.

**Conference hears how farmers like to learn**

Dairy farmers benefit from learning from other farmers, they value farm visits and are keen to attend locally relevant field days, a Gippsland dairy farmer told a major national conference on climate change. Gillian Hayman, from Fish Creek told the conference that a key to attracting farmers was to hold events based on locally relevant topics.

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Dry lots and feed pads, changes to calving pattern, summer feed strategies and managing extreme weather events were among the topics covered in the project.

“Farm visits were critical to success, with farmers valuing the opportunity to see an innovation working and discuss related issues with the farmer implementing the innovation,” Gillian said.

“Farmers and service providers attending MAADI events showed substantial interest in the technical data.” A post-project evaluation showed that 94% of dairy farmer respondents and 85% of service provider respondents said they learned something that they could apply to their dairy farm business.
The project, which ran from June 2010 and June 2012, saw a group of SA dairy farmers travel to Northern Victoria to learn directly from farmers about their experiences adapting to drier conditions. In Gippsland, bus tours allowed farmers to visit several farms integrating feed pads into dry land farming systems.

Dairy Australia’s Natural Resource Management Program Manager Cathy Phelps said: “Most events focused on an individual farm business and involved farmer-to-farmer learning. Case studies were prepared for many of the activities to extend the knowledge and findings beyond the event itself. In some cases, information sheets developed in one region were used by other interstate dairying regions.”

Further information about the project can be found at http://frds.dairyaustralia.com.au

Balancing phosphorous = efficient use of dollars

The DairySA Soil Nutrient project is designed to help farmers identify, map and monitor soil acidity and nutrient levels in individual paddocks, with the aim of maximising fertiliser efficiency and reducing nutrient loads into the environment.

Farm Profile
Manager: Nick Saunders
Agronomist: Jim Burford
Location: Kongorong, Lower South East, SA
Land area: 128 Hectares (Ha) effective
Soil type: clay loam over limestone, terrain is flat
Average annual rainfall: 720mm
Herd Size: 450 cows
Milk Production: 2008/09: 180,000kg/year milk solids from 410 cows
Now 201,000kg/year milk solids
Feeding System: Pasture based with a small amount of grain feeding (3kg/day at present) in the shed
Milking: 40 stand rotary dairy
Labour: Nick and his wife Jo, along with one full time staff member and a number of casual staff
Water & Irrigation: Perennial ryegrass and clover, some newly renovated, 70 Ha under centre pivot
20 Ha under hard hose travelling irrigator

Having recently joined Oamaru, Nick has used the experience and expertise of Elders Agronomist Jim Burford to review soil tests and changes in fertility since 2010 and provide guidance on future fertiliser applications required on the farm.

ABOVE: Oamaru’s Nick Saunders in the paddock with Elders agronomist Jim Burford

Description of trial
- 2010 soil testing identified that there were high levels of Phosphorus (P) in most paddocks.
- Regional Olsen P targets are around 30mg/kg, however levels at Oamaru averaged more than 73mg/kg and ranged from 34 to 113.6mg/kg.
- This range meant that most paddocks at Oamaru could have significantly reduced P applications.

Jim Burford: “Most farms have variable soils, so testing a large number of paddocks provides an overall view of the farm and its potential, allowing a focus on the application of the right type of fertiliser where it’s needed. This leads to a more efficient use of the farm fertiliser dollar.”

More on the trial
- 2012 soil testing has shown that some paddocks still have very high levels of P: over 60mg/kg, up to 112mg/kg.
- Other paddocks have fallen below critical levels and will need to be incorporated in this year’s fertiliser program.
- Average P levels dropped from 73mg/kg in 2010 to 47mg/kg in 2012.
If using only average, or a smaller number of soil tests, it would have been difficult to identify those paddocks below target nutrient levels.

Plant tissue testing effectively complemented the soil testing to help confirm where the soil tests were suggesting trace elements were needed.

The three year DairySA soils project has highlighted the value of ongoing and intensive soil testing to better manage soil fertility through lower expenditure on fertiliser while still maintaining pasture growth. Participants have heightened their awareness of soil testing, fertility mapping and fertiliser planning.

Jim again: “The soil testing allowed Oamaru to take a more ‘prescription farming’ approach where closer attention was paid to the phosphorus, potassium, sulphur and trace element needs, confirmed by plant tissue tests.”

“Good soil and tissue testing information will ensure you are able to target your fertiliser spending where you really need it, getting the best productivity return.”

The Reducing Soil Acidification Through Nutrient Management In SA project is funded through the Australian Government’s Caring for our Country program and managed through DairySA.

**The Dairy Industry Wants Fert$mart**

A key message from the Fert$mart workshops held in each Australian dairy region during August and September was to “get Fert$mart rolled out”! This is only one message of many that were put forward by the 135 participants who attended the workshops. The feedback from the workshops has now been compiled into a report and is being used to shape the national nutrient management guidelines to best meet the needs of the dairy industry.

The workshop feedback supported findings from a recent Dairy Australia survey on fertiliser management practices. The survey showed significant trends in the number of dairy farmers using consultants and fertiliser suppliers for advice. Farmers seeking independent advice from consultants has risen from 28% to 57% over the past 12 years. There are now fewer dairy farmers drawing on past experiences to work out fertiliser requirements.

This feedback has highlighted the need for Fert$mart to focus more on the advisor/farmer partnership which is becoming increasingly important. The report also showed that soil testing remains the ‘bottleneck’ to better fertiliser management (38% of dairy farmers soil test annually). The low uptake of regular soil testing is contrary to industry sentiment that soil testing is a high priority.

It was apparent from the workshops that nutrient budgets were generally not well understood and this helped to explain why nutrient budgets are not more widely used by dairy farmers (30% nationally).

The workshop also helped to work out the priorities for Fert$mart. A trusted source of soil and fertiliser management science which is tailored specifically to dairy farms was considered the most important component. This was followed closely by information on research and trials, optimum soil fertility guidelines, and a paddock record keeping tool for fertiliser management.

Other things highlighted as important were a step-by-step guide to fertiliser planning, the Fert$mart website, and a list of best management practices and case studies. Case studies were of greater value to dairy farmers than to farm advisors and consultants.

Dairy farmers and advisors shared their concern about the growing number of untrained salespeople who are providing poor quality advice and promoting unproven products to dairy farmers. It was thought that wider adoption of Fertcare accreditation could help to build credibility and trust in the industry. Fert$mart has already helped to move this along by coordinating Fertcare C training for 13 farm advisors in Melbourne during October.

Moving forward, the Fert$mart team will continue to forge ahead in developing the various components of the national nutrient management guidelines, knowing that the concept has widespread industry support.

At the same time Fert$mart planning pilots are being rolled with farmer groups and their local advisors in Victoria and South Australia. The aim of the Fert$mart
pilots is to test the guidelines and improve the final product before the launch in mid-2013.

Fert$mart is a Dairy Australia initiative and receives funding support from the Australian Government’s Caring for Our Country Program. For more information about Fert$mart contact the project coordinator, Rick Kowitz, email rkowitz@dairypage.com.au or mobile 0427669994.

**Fert$mart to be piloted in South Australia**

Through DairySA, the Mt Torrens Dairy Discussion Group will pilot the Fert$mart process in SA and, at the same time, other dairy farms across the state involved in the SoilsSA project will be incorporating Fert$mart ideals into their soil testing and fertiliser budgeting projects.

The objective of Fert$mart processes is that farmers can implement a more targeted application of fertiliser leading to better pasture growth and a lower risk of nutrient losses to the environment.

The Mt Torrens group will be coordinated by Bryan Robertson, a local agronomist, who will work with each participant to identify which paddocks will be soil tested and which nutrients analysed at each site. The soil test results will be illustrated on farm maps so it is easy to identify which paddocks have adequate fertility levels and which need to be addressed by the farm fertiliser plan. He will then use the Fert$mart process to develop a fertiliser plan for each farm.

‘The whole aim of this project is for Mt Torrens dairy farms to identify how to maximise returns with strategic applications of specific fertilisers based on soil test results,’ said Bryan.

DairySA has achieved an NRM Community Grant through the State Natural Resources Management Program to allow the Mt Torrens group to conduct additional soil testing. Mt Torrens farmer Rick Gladigau already soil tests every year and is looking forward to the project providing him with a wider range of soil tests from a larger number of paddocks across his farm.

With this information, and the fertiliser plan developed through the Fert$mart process, Rick will be able to target nutrients that are limiting pasture productivity, resulting in increased pasture production. His existing soil tests will be used to highlight how fertility in each paddock is tracking over time: whether it is increasing, decreasing or steady within the adequate range for each nutrient.

Fert$mart aligns with the principles of the International Plant Nutrition Institute’s ‘4R’ Nutrient Stewardship program. The 4R concept is simple and practical - apply the right source of nutrient, at the right rate, at the right time, and in the right place. This common sense approach reduces soil acidification, minimises environmental impacts, and contributes to more sustainable dairy farming systems.

**Fert$mart is jointly funded by Dairy Australia and the Australian Government’s Caring for Our Country Program and delivered in South Australia through DairySA.**

**Is Composted Urban Waste an Option for Dairy Farm use?**

As waste from urban areas increase, composted materials are becoming available for use on farm. Recently a group of Gippsland farmers & interested extension staff were hosted by Compost Victoria to inspect composting facilities in Melbourne’s south east. The purpose of the visit was to see the composting facilities, hear about industry standards and consider the strengths, weaknesses, opportunities and threats of applying urban compost materials to dairy farms. Dr Robin Condron, Manager of Animal Health & Welfare with Dairy Australia also attended.

One of the sites visited in Dingley Village was an open windrow system. Urban sites are moving toward the closed vessel system such as the one visited at Dandenong. Gippsland is also serviced by a large facility at Dutson Downs near Sale. A new facility at Pakenham is expected to come on line in 2015.
A full report of the visit is available from Gillian Hayman  ghayman@dcsi.net.au

Some recommendations following the visit are;

✓ Further work should be undertaken to understand the nutrient value of compost material being offered to dairy farmers.
✓ Trial work would allow demonstration and validation of compost as a nutrient source for dairy farms.
✓ Anyone considering the use of composted urban waste should be made aware of the potential risks involved in using this material and what precautions should be considered.

ABOVE: The open windrow composting facility at Dingley Village

ABOVE: Tour participants hearing about the closed vessel composting facility at Dandenong

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