Life-long learning – an essential requirement for today’s farm advisers

The New Zealand agricultural landscape is experiencing unprecedented challenges relating to productivity. Gone is the attitude to simply intensify production, with farmers now facing the on-going challenge of maintaining and, hopefully, enhancing productivity, while at the same time managing their environmental footprint and remaining globally competitive.

Farm advisers play a critical role in assisting farmers to achieve this delicate balance through technology transfer. To do so effectively in today’s world they must keep up to date with the latest, and often complex, technological innovations in their field. This highlights the vital role of Continuing Professional Development, or CPD – the on-going requirement to undertake professional development activities to maintain and grow practitioners’ knowledge and skills, and stay abreast of new developments in their field.

Precision agriculture – achieving the greatest outputs while using the least inputs – is a good example of a fast-moving and complex technology that farm professionals need to continually stay abreast of. Precision agriculture involves the fusion of information technology and engineering, including remote sensing, data processing and automation, to enhance the timing and accuracy of inputs, such as fertiliser, and is key to achieving sustainable agriculture going forward. The nutrient budgeting support tool, OVERSEER®, is another good example of applied R&D that advisers need to maintain currency with. In the case of OVERSEER®, agricultural scientists, farm system modellers, computer scientists and information technologists work together to produce, maintain and further enhance nutrient management software that is helping New Zealand farmers understand nutrient cycling on their farms, optimise their nutrient inputs and minimise losses to the environment.

The benefits of these technological advances are only captured when they are adopted and properly implemented by farmers. Given the rapid pace of technological change in the primary sector, and its growing complexity, this is becoming a more and more difficult task. This is one of the reasons why CPD is an integral component of the certification programme for nutrient management advisers.

The feedback from our team of certified advisers confirms that CPD is, from their perspective, one of the most valuable parts of the programme. It gives them the opportunity for ongoing learning and growth within a structured environment as part of their career pathway. From the client’s perspective, it ensures that certified advisers are providing them with up to date expertise to help them prosper in a rapidly changing world.

For more information visit: www.nmacertification.org.nz

1 The CPD policy for the Certified Nutrient Management Adviser Programme can be found at http://www.nmacertification.org.nz/Site/Nutrient_Management/CPD/default.aspx

Certification and upcoming modules

Nutrient management advisers must complete at least 15 hours of approved CPD activities each year to remain certified. These activities can include participation in approved conferences and workshops, completion of post-graduate courses, presentations at conferences and workshops, and publication of scientific papers. As part of the CPD requirements, advisers must complete compulsory educational modules on topics approved by the programme’s Standard Setting Group. Examples include modules on the Tiered Fertiliser Management System (the basis for managing cadmium accumulation in agricultural soils) and the use of OVERSEER® on irrigated enterprises. Modules soon to be released include further exercises on irrigation, mitigation of nitrogen loss on dairy farms, and the use of OVERSEER® on sheep and beef enterprises.
Long-term fertiliser trial provides important insights on hill country productivity

The Ballantrae Hill Country Research Station is located in southern Hawke’s Bay and is typical of much of the North Island’s pastoral hill country farmland. The Research Station has been the site of a remarkable trial that dates back to 1975, providing important insights into the value of the long-term use of phosphorus fertiliser in supporting pasture production, sheep stocking rates and performance on New Zealand’s legume-based pasture systems.

This is highlighted in a recent report produced by AgResearch that summarises the results of monitoring of soil fertility, pasture production, pasture composition and stocking rates at Ballantrae for the 2015/16 year. These parameters were monitored on three different farmlets that have received three different rates of phosphorus fertiliser as superphosphate since 1980. Pasture production on each of these farmlets is summarised in the table below:

<table>
<thead>
<tr>
<th>FERTILISER RATE (kg single super phosphate/ha/year)</th>
<th>PASTURE GROWTH RATE (kg dry matter/ha/day)</th>
<th>ANNUAL PASTURE YIELD (kg dry matter/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No fertiliser</td>
<td>19</td>
<td>6,917</td>
</tr>
<tr>
<td>125</td>
<td>27</td>
<td>9,708</td>
</tr>
<tr>
<td>375</td>
<td>31</td>
<td>11,289</td>
</tr>
</tbody>
</table>

These results show that the input of 125 and 375 kg of SSP/ha/year increased annual pasture growth rates by 40% and 63%, respectively, in the 2015/16 year. Utilising the pasture produced, sheep stocking rates increased by 50% and 120%, respectively. Olsen P levels on the “no fertiliser” farmlet had dropped to an average of four, which is well below the levels of 20–30 for near maximum pasture production for sedimentary and ash soils, whereas Olsen P levels on the “low” and “high” fertilised farmlets averaged 13 and 49, respectively.

While low fertility grasses dominated in all pastures, legumes and high fertility grasses were largely absent in the farmlet receiving no fertiliser. What is also interesting, and unanticipated, is the difference in sheep grazing patterns observed on the steep and moderate slopes, with little to no grazing now taking place on the slopes not receiving phosphate fertiliser. This pronounced difference in grazing behaviour and level of pasture utilisation between the no fertiliser and high fertiliser treatments is a very visible feature of the long-term study.

The decades-long series of data generated by the Ballantrae field trials also provides an unparalleled opportunity to monitor historic trends in hill country agriculture. For example, in their report, the authors were able to compare pasture growth rates in 2015/16 with those measured on the same sites under the same management back in the 1980’s. Such unique insights cannot be obtained anywhere else for hill country.

The results from the 2015/16 year summarised here are just a small example of the very important insights that can be obtained from the Ballantrae long-term field trials, which are showing how dry stock farmers can optimise soil fertility, pasture production and quality, and animal carrying capacity on their land. This can mean a difference of tens, or even hundreds of thousands of dollars in profit between low and high performing sheep and beef farms around the country.

The Ballantrae Research Station is obviously a very important national asset for New Zealand, not only for research and development, but also for teaching and extension. It is the only resource of its kind now available for monitoring long-term trends on hill country in New Zealand. Other sites which previously provided long-term data of this kind, such as at Te Kuiti and Whatawahata, are now lost. The only other similar facility in New Zealand is the long-term fertiliser trial at the Winchmore Research Station in Canterbury, which is on flat irrigated land, also grazed by sheep. It is therefore very important that these two remaining sites, and the long-term trials taking place on them, are preserved for the benefit of New Zealand agriculture.

AgResearch has leased the Ballantrae farm to the Taratahi Agricultural Training Centre, which will take over the day-to-day operation of the site, with clear benefits for training and extension services. Likewise, the long-term management and operations of the Winchmore research station are under review, with an invitation to primary industry to step up and play a proactive role to ensure this resource is well utilised. It would surely be a great loss for New Zealand agriculture if these two remaining nationally significant science resources are not utilised to their full potential.

1 A.D. Mackay, D.A. Costall, J. Koolaard (2016), AgResearch Ballantrae long-term phosphorus fertiliser and sheep grazing study: Monitoring in 2015–16 (PERMISSION NEEDED to reproduce information)
Research investment fuelling agricultural development

The need to manage the conflicting pressures of increased agricultural production and environmental protection is not unique to New Zealand. It is a global priority centered on achieving food security within environmental limits. Obviously, New Zealand cannot feed the world alone, but through the Fertiliser Association’s investment in research and improved farming systems, we have a role to play in delivering the science and technologies to support efficient, safe and sustainable farming, as well as ensuring that New Zealand farmers remain commercially competitive and recognized as sustainable producers of high-value, safe and nutritious food.

The Association’s research investments can be categorized under several overarching themes that include: economic efficiency in nutrient use; productivity gains; understanding and modeling nutrient flows and losses; management within environmental limits; long-term implications of fertilizer use; managing soil contaminants; and developing industry capability and human resources.

While the Association invests in industry-good research programmes, projects of more specific commercial application are also being accelerated by our member companies in partnership with central government through the Primary Growth Partnership (PGP) scheme. This means that, in addition to the many millions of dollars invested over recent years through the industry Association, these PGP programmes deliver a further $15 million of fertilizer industry-funded research over seven years, with anticipated economic benefits to the country of over $450 million by 2030, or sooner.

It goes without saying that this research would be of little value if it was not made accessible to rural professionals and farmers. That is why the Association places great importance on supporting the timely publication of research results and synthesising science into user-friendly material. We have supported the publication of many papers in peer-reviewed scientific journals. Furthermore, information supporting responsible use of nutrients is provided in a series of user-friendly booklets which are made available to the public. For example, our booklets such as “Fertiliser Use on New Zealand Dairy Farms” and “Fertiliser Use on New Zealand Sheep and Beef Farms” provide farmers and rural professionals with clear and concise information on the principles of soil fertility and fertilizer use. Over the years there have been several revised editions with tens of thousands of these booklets distributed as hard copies, in addition to those downloaded for free on the Fertiliser Association’s website.

Many of the research themes identified in this article will be expanded on in future issues of this newsletter. In the meantime, a brief summary of some of the industry-good research projects that we have supported can be found on the Fertiliser Association’s website: www.fertiliser.org.nz

This is the first in a series of articles looking at the research projects funded and supported by the Fertiliser Association of New Zealand. Each year the Association invests well over $1 million in support of industry good research that benefits New Zealand agriculture and New Zealand Inc. The overall focus of this investment is to help deliver the Association’s vision of supporting productive, economic and environmentally sustainable farming through responsible nutrient management. We fund innovative research projects that lead to new technologies that provide gains in production efficiencies while providing for environmental benefits.

The Fertiliser Association’s Resource Centre provides links to several e-book resources including “Fertiliser Use on New Zealand Dairy Farms” and “Fertiliser Use on New Zealand Sheep and Beef Farms”? Check them all out at: www.fertiliser.org.nz!

INDUSTRY UPDATES

NMACP welcomes RMPP’s Michael Smith to Board

General Manager of the Red Meat Profit Partnership, Michael Smith, has recently been appointed to the board of the Nutrient Management Adviser Certification Programme (NMACP). Michael has a southern farming background and has spent most of his career in the rural sector including the stock and station industry, rural finance, business, IT and project management. He has an agricultural commerce degree and a postgraduate qualification in development studies. With his extensive expertise and experience in the primary sector, Mr Smith will no doubt provide valuable input to the governance of the certification programme.

OVERSEER® officially operating as “OVERSEER® Limited”

OVERSEER® Limited has been formally established to manage, develop and license OVERSEER® on behalf of the owners – the Fertiliser Association of New Zealand, AgResearch Limited and the Ministry for Primary Industries. The move to OVERSEER® Limited was announced late last year with the final “t’s” crossed and “i’s” dotted, in April. The new company remains managed by Chief Executive, Dr Caroline Read. OVERSEER’s focus for the next three years will be to complete the establishment of the formal quality assurance programme, as well as the transition to market and developing OVERSEER’s customer services offering. This work will be supported by a substantial funding increase of $750,000 per year, bringing total funding to $2.25 million per year over three years.
Cadmium

What is cadmium?
• Cadmium is a naturally-occurring element present at low levels in air, water and soils around the world.
• Trace levels of cadmium occur naturally in phosphate rock, from which phosphate fertiliser is made.
• Where there is long-term regular use of phosphate fertiliser, cadmium may accumulate in the top soil.
• Soil cadmium can be taken up by plants and, through this pathway, enter the food-chain. However, typical dietary levels are well within acceptable limits set by the World Health Organisation.
• Cadmium in New Zealand soils poses no immediate concern to human health or the environment. It is an issue because it is prudent to manage soil cadmium over the long-term.

How is it managed?
• A voluntary limit is imposed on the level of cadmium in fertilisers sold in New Zealand.
• A strategy has been implemented in New Zealand to manage cadmium accumulation in New Zealand soils. It is administered by the Cadmium Management Group which includes: Ministry for Primary Industries (MPI); Ministry of the Environment (MfE); Waikato, Bay of Plenty, Taranaki, Greater Wellington and Canterbury Regional Councils; primary industry representative groups; and the fertiliser industry.
• Soil cadmium is monitored by regional councils and soil cadmium assessment is also included in fertiliser industry programmes.
• Food standards are implemented by MPI, and monitoring of the typical New Zealand diet is undertaken as part of the Total Diet Survey every five years.
• Soil guideline values are applied under a Tiered Fertiliser Management System: http://www.fertiliser.org.nz/Site/resource_center/Tech_Papers.aspx
• Farm practices can be amended to reduce cadmium uptake by plants from the soil where advisable.
• The Cadmium Management Strategy is designed to ensure cadmium levels remain within acceptable limits well into the future: http://www.massey.ac.nz/~frc/workshops/11/Manuscripts/Rys_2011.pdf

Research
• New Zealand continues to research and monitor the impact of cadmium in soils, plant uptake and potential mitigations.
• New Zealand-specific research continues to inform the Cadmium Management Strategy.

More information
http://www.massey.ac.nz/~frc/workshops/16/Manuscripts/Paper_Abraham_2016.pdf

EVENTS

NZIPIIM National Conference
8–9 August 2016, Rydges Rotorua
Rotorua, New Zealand

The NZ Institute of Primary Industry Management's National Conference programme will have a strong environmental focus, particularly as changes in various regional council plans take effect. It will examine the latest research on mitigation strategies for nitrogen loss, provide an economic analysis of meeting nutrient limits, and examine what this means for rural professionals providing nutrient management advice to their farming clients.

The conference also aims to provide delegates with a deeper understanding of Māori agribusiness and farming operations and will include industry sector updates on the dairy, sheep and beef, forestry, horticulture and Mānuka honey industries. There will also be a session on business and extension skills. This will include understanding the next generation of clients and employees, and marketing professional services using social media.

More information on the conference programme is available in the Events section of the NZIPIIM website www.nzipim.co.nz.

Wild Places
10–11 August 2016
Viaduct Events Centre, Auckland

The Environmental Defence Society’s 2016 conference will explore New Zealand’s Wild Places and assess both emerging threats and exciting new opportunities. It will draw on insights from international and local experience, case studies and workshops. It will look creatively at the development of powerful new synergies between conservation and tourism and will explore novel management and funding initiatives. More information is available on the event website: www.edsconference.com.

7th International Nitrogen Conference (INI 2016)
4–8 December 2016
Melbourne, Australia

The theme of INI 2016 is “Solutions to improve nitrogen use efficiency for the world”. Early bird registration closes 26 August for this event with full, student and day registration options available. More information can be found on the conference website: www.ini2016.com.

Soil, a Balancing Act Downunder
12–16 December 2016, Queenstown

This joint conference of the NZ Society of Soil Science and Soil Science Australia will draw together scientists, land users, policy makers and other rural and urban stakeholders. This trans-Tasman event only occurs once every four years, and will present the latest research on soil and land-based issues, and will include debates regarding the current challenges being faced in balancing land production vs environmental values. The programme includes optional field trips, international keynote speakers, soil judging events and networking functions. To register for the event or submit an abstract, visit: www.nzsssconference.co.nz.