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Effective effluent management requires techniques that match soil and land type according to (From left:) Dr David Houlbrouke, Dr Richard Muirhead and Dr Ross Monaghan.

Research helps effluent management challenge

AgResearch's Dr David Houlbrooke is leading some of the research into why the same effluent management practices can produce good results on some farms but poor ones on others.

"It's not just that there's more effluent, there are marked changes in the volume and types produced, due to increases in quantities of imported feed and greater use of animal confinement facilities. It's very clear we need more understanding of how the various soils and land types are able to process effluent at a farm scale," says Dr Houlbrooke.

One of the key starting points for Dr Houlbrooke and his colleagues is that not all soils are created equal and effluent management needs to take account of what's under the turf as well as the geography and climate.

"The management of farm dairy effluent in New Zealand has typically involved the daily collection of wash down effluent to a concrete sump and then applying it to the pasture using a twin boom travelling irrigator. Changes have involved pond storage during wet periods and increased control of application depths and rates, but the real improvements will come from understanding the soil and the land to define the risks," says Dr Houlbrooke.

The ability of soil to absorb effluent nutrients will be lower where there is artificial drainage or coarse structure, or where soils have infiltration or drainage problems. Land which is rolling or sloping also has less capacity to absorb and process waste mater, compared to well drained flat land with fine to medium soil structure. The effect of these conditions can be made worse by climate.

"This knowledge is vital to understanding the potential for effluent contamination and developing farming management systems, and unfortunately until now we've had a one size fits all approach regarding how we manage our dairy effluent," says Dr Houlbrooke.

Generally we know that well drained soils perform well in their ability to filter faecal microbes and attenuate applied nutrients. However, well drained soils can deliver greater amounts of drainage water than poorly drained soils and can provide more opportunity to leach nitrate resulting from direct deposition in animal urine patches.

Dr Houlbrooke says ones reason why there has been strong progress on this work is the team of experts working in AgResearch and collaborating with those from other organisations. "It's great to see soil science solutions being used in an applied dairy farming system and helps uncover for many what has in the past been part of the mystery that lies below," he says. Other scientists involved in the development of the tool for effluent management include Dr Ross Monaghan and Dr Richard Muirhead.

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Review highlights research success

AgResearch's new Science Review highlights how decades of research has supported and contributed to the success of New Zealand's pastoral sector.

For scientists at AgResearch, small and steady increments of progress are behind much of the research that helps to underpin New Zealand's prosperity. However in a world obsessed with overnight success and blockbuster breakthroughs, the results from years of patient study repeatedly fly under the radar.

As newsletters and media releases are often not long enough to highlight the essential, enduring nature of research, AgResearch aims to close that gap with its new publication called the Science Review 2010.

The Review, the initiative of AgResearch Chief Scientist Dr Stephen Goldson, gives the progress of key research and in some cases follows younger scientists and research developing alongside each other. "AgResearch scientists and people we have worked with have made huge strides in various areas of important research. This Review shows the breadth of achievement from the starting points to today and tells how important and effective science has been in developing pastoral agriculture and the New Zealand economy," says Dr Goldson.

The publication highlights a sample of the work, some of which has spanned generations, being done in a range of fields and shows the effectiveness of government science effort in working for both industry and public good.

Science Review 2010 outlines detailed science but is aimed at a lay audience. It highlights specifics of work being done on freshwater management on farms, biocontrol of pests of pastures, use of symbiotic, endophytic fungi to control pasture pests, the development of GM forages, management of drench resistance to nematode parasites in sheep, the microbial complexity of the rumen, the importance of DNA sequencing to genetic gain in sheep and beef cattle, and ways to ensure New Zealand lamb and beef remains the world's best.

AgResearch Science Review - highlighting decades of research achievement.

Award for 30 years service to the deer industry

AgResearch Scientist Dr Colin Mackintosh was honoured last month with the 26th Deer Industry Award, recognising his 30 years of service to the deer industry.

Dr Colin Mackintosh receives his award for 30 years of service to the industry. Photo: The Deer Farmer, NZX Agri.

In front of the Deer Industry Conference made up of his peers, colleagues and friends Colin was clearly moved by the award.

The nomination was supported by Professor Frank Griffin of the University of Otago and Tony Pearse the Producer Manager of the Deer Institute of New Zealand. Tony Pearse said in his nomination that Colin could utter the phrase 'I was just thinking' 'at any stage during research project, on-farm advice, session, phone call, industry meeting, conference, forum, car trip, straight hard yards deer session: bleeding measuring, weighing, post mortem or social function and almost certainly in his sleep.'

Colin's enquiry, intuition, intellect and commitment were cited and the list of his papers, achievements and contribution were mentioned. In particular the development of yohimbine, a reversal agent for sedation in deer, and the Yersiniavax vaccine against yersiniosis.

Dr Mackintosh has made significant contributions to the work on Johne's disease and TB and established a quarantine facility for TB research in deer. His work protecting the industry from 'ill-considered and restrictive regulations' was also mentioned.

Dr Jimmy Suttie, AgResearch's interim Chief Operating Officer, said the award is recognition for an intelligent, committed and forthright scientist. 'Colin's achievements speak for themselves but his strong relationship with the deer industry and the people he has worked with also stand out in his scientific and deer industry career.'

Auckland school students visit research farm

Nearly 40 students from Years 10 and 11 at Pukekohe High School in Auckland visited the Agritec Centre at AgResearch's Tokanui Dairy Research farm in May.

For many of the Pukekohe High School students it was their first time on a farm, or seeing a live cow.

The students, some of whom will begin rural studies later this year as part of their curriculum, were able to have a hands-on farm experience.

Some of the students who had never been on a farm before were captured on video smelling fermented silage, tasting molasses and even having a go at putting milking cups on: under the watchful eye of dairy farm staff. Their very surprised, delighted and disgusted responses can be seen on the video link at the end of this story.

Funded from a small profit on table sales at AgResearch's successful Celebrity Debate during the National Field Days Week, this trip seemed a good way to give something back and create a rural experience. Agritec Educator Dr Debbie Care set the scene drinking what was coloured water, which the students thought was urine, from a milk bottle. AgResearch farm staff then gave presentations on AI ryegrass and forages. Following lunch the students got a chance to meet the calf population before returning to do the afternoon milking.

Watch the video

CLICK HERE

Science Advisor to help build Māori relationships

AgResearch has recently appointed Dr Tanira Kingi as Science Advisor Māori, to help build relationships with Māori and lead research for the pastoral sector and Māori landowners.

His role is to assist in building collaborative relationships with iwi groups and Māori organisations to work with Māori in lifting farm productivity, profitability and environmental sustainability. Dr Kingi is well-known within New Zealand's primary industry with practical experience in the horticulture, forestry, sawmilling and agricultural consultancy sectors prior to joining Massey University's agricultural systems management group in the mid 1990s. Dr Kingi has worked extensively with Māori farming businesses and has held a number of appointments on incorporations and trusts. As an agricultural economist he has managed a number of research programmes related to Māori agribusiness and has published widely on Māori land tenure and agricultural development.

"I'll be there to help AgResearch better engage with Māori and build relationships"

Dr Kingi is is affiliated to Te Arawa (Ngāti Whakaue, Ngati Rangitihi, Ngati Makino) as well as Ngati Awa and Ngai Tai.

Dr Tanira Kingi, AgResearch's Science Advisor Māori.

AgResearch and Lincoln University collaborate using TV

If you've been watching Country99TV on Sky you'll know that AgResearch and Lincoln have joined forces to present discussions on important farming issues.

The three shows, which ran in the first half of June, can be viewed via the video link at the end of this story.

This venture into TV was seen as a great way to explain issues that are important and need some explanation so farmers and others can understand them in more detail. Climate change, farming systems and biocontrol were the first 3 episodes and each provoked animated discussion from the panellists. On each show AgResearch and Lincoln experts appeared.

All the shows raised many points and were aimed at a general but interested audience.

The discussion on climate change covered the importance of agricultural greenhouse gas emissions to New Zealand and outlined some of the key research work that is being conducted to mitigate these GHG emissions. Lincoln University's Professor Keith Cameron said he was able to emphasise the importance and relevance of this research work to NZ, the excellent collaboration that is occurring between research scientists working on GHG emissions, and the exciting new developments that are occurring through the creation of the New Zealand Agricultural Greenhouse Gas Research Centre.

Watch the video

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Highlights from the AgResearch exhibit on the opening day of National Field Days, Mystery Creek


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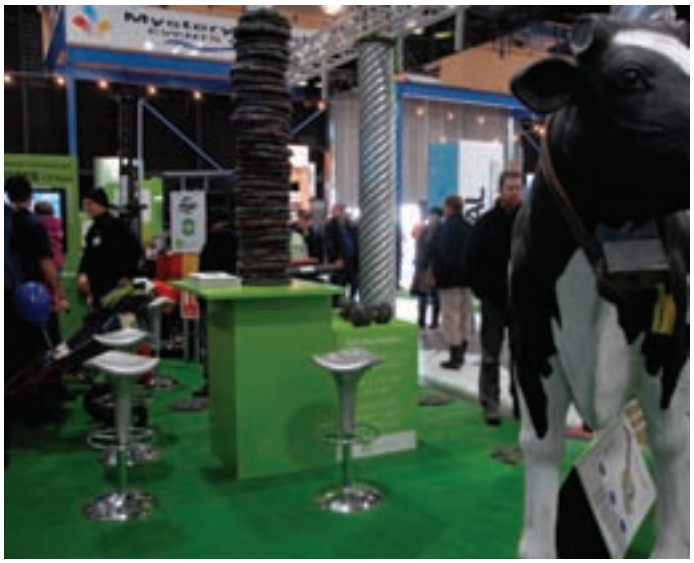
litres per year!

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Saliva protein research to help combat human oral disease

Dr Tom Wheeler and his team at AgResearch's Ruakura campus are receiving $US 300,000 over four years to look at how a saliva protein can combat oral disease.

And the work is for human dental and oral health. The saliva protein BSP30 (bovine salivary protein, 30 kilodaltons) was identified in cattle but now Dr Wheeler and his team are working alongside Professor Sven-Ulrick Gorr, from the University of Minnesota in Minneapolis, who is investigating the role of the human equivalent of BSP30.

"Naturally we're pleased to get this recognition which allows us to take our work further. What is particularly important is the collaborative relationship with the University of Minnesota, it gives us access to their work and also gives us an opportunity to boost our work in this area," said Dr Wheeler.

Left to Right, the successful team Kwang Kim, Marita Broadhurst, Grant Smolenski, Megan Callaghan, Dr Chris Morris, Dr Tom Wheeler (seated), Dr Brendan Haigh and Neil Cullen.

The origins of this success go back to the mid 1990s. Dr Wheeler and his team of researchers along with geneticist Dr Chris Morris detected a protein in saliva from dairy cattle that appeared to vary among individual cattle. The thinking then was this could be used to help research into bloat and other similar diseases.

AgResearch's publication of work on the BSP30 family was the first success. Subsequent work and publications established the team as a world-leading group in the characterisation of these proteins, and has attracted interest from overseas researchers who were investigating the role of similar proteins in humans. The research is a long term programme; for example one of the key scientists who has played a significant role in the BSP30 work over the years is Dr Brendan Haigh. As a masters student, he was the first to isolate and sequence some of the genes encoding the BSP30 proteins. Following his PhD at the University of Otago and post-doctoral work overseas he returned to the team last year.

The team is looking forward to working with Professor Gorr to understand the role of these saliva proteins in dental and associated diseases.

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