



Photo: TIM MANLEY

MacDiarmid award winner Natalie Harfoot with Jo-Jo at AgResearch Invermay's possum enclosure.

AgResearch young scientists win at MacDiarmid Awards

Doctoral student Natalie Harfoot and post doctoral scientist Dr Matthew Barnett each won awards during this year's MacDiarmid Young Scientists of the Year Awards.

Natalie won the MacDiarmid Award's Science and Our Society category for her work on possum physiology, while Matthew received one of three EE Dalton Awards that were presented in conjunction with the MacDiarmid awards. The EE Dalton Awards are made from a bequest for research purposes to the Foundation for Research, Science & Technology (FRST) from Elizabeth Ellen Dalton, of Riverton in Southland. The bequest is being used as a one-off award to recognise excellent research and emerging leadership of post doctoral scientists.

Natalie is a University of Otago doctoral student working in a team comprised of people from AgResearch Invermay's Reproductive Biology Section and the university's Physiology Department. New species-specific poisons to control possums could be developed as a result of her research that focuses on the mechanism that the possum uses to maintain water balance in the intestine.

Matthew works for AgResearch's Food, Metabolism & Microbiology Section as part of Nutrigenomics New Zealand — a collaboration between the University of Auckland, AgResearch, HortResearch and Crop & Food Research. He is researching how different foods affect individuals based on their genetic variation.

Natalie has identified a protein in possums that transports sodium and bicarbonate ions into the small intestine to drive the secretion of water. The aim of the research, being carried out for the National Research Centre for Possum Biocontrol, is to develop toxins that target this protein — upsetting water balance and causing death.

"The competition focuses on science communication which is an extremely important skill and encourages young scientists to think about different ways to present their research to a general audience," says Natalie.

"It's been a valuable experience for me and I'm looking forward to further utilising these skills in my research career."

Matthew's award recognises him as being at the international forefront of his specialist area of research. It is also a reward for regularly presenting at international conferences, participating or collaborating with other researchers worldwide, and being a mentor to young scientists in New Zealand.

"I believe it's very positive that the achievements of young scientists are recognised early in their careers and I'm pleased and honoured to receive this award," he says.

"I'd like to acknowledge the people at AgResearch who have provided opportunities and encouragement, without which I would not have been in a position to apply for the award."

Going from strength to strength

Some of AgResearch's innovative research displayed at Mystery Creek National Fieldays was picked up by major media outlets and drew serious commercial inquiries.

"A highlight was the Textiles Group's 100% wool suit – a prototype which is the first in the world able to be machine washed and tumble dried. It was the focus of our Wearable Science fashion show at Fieldays," says Corporate Affairs Manager Allannah James.

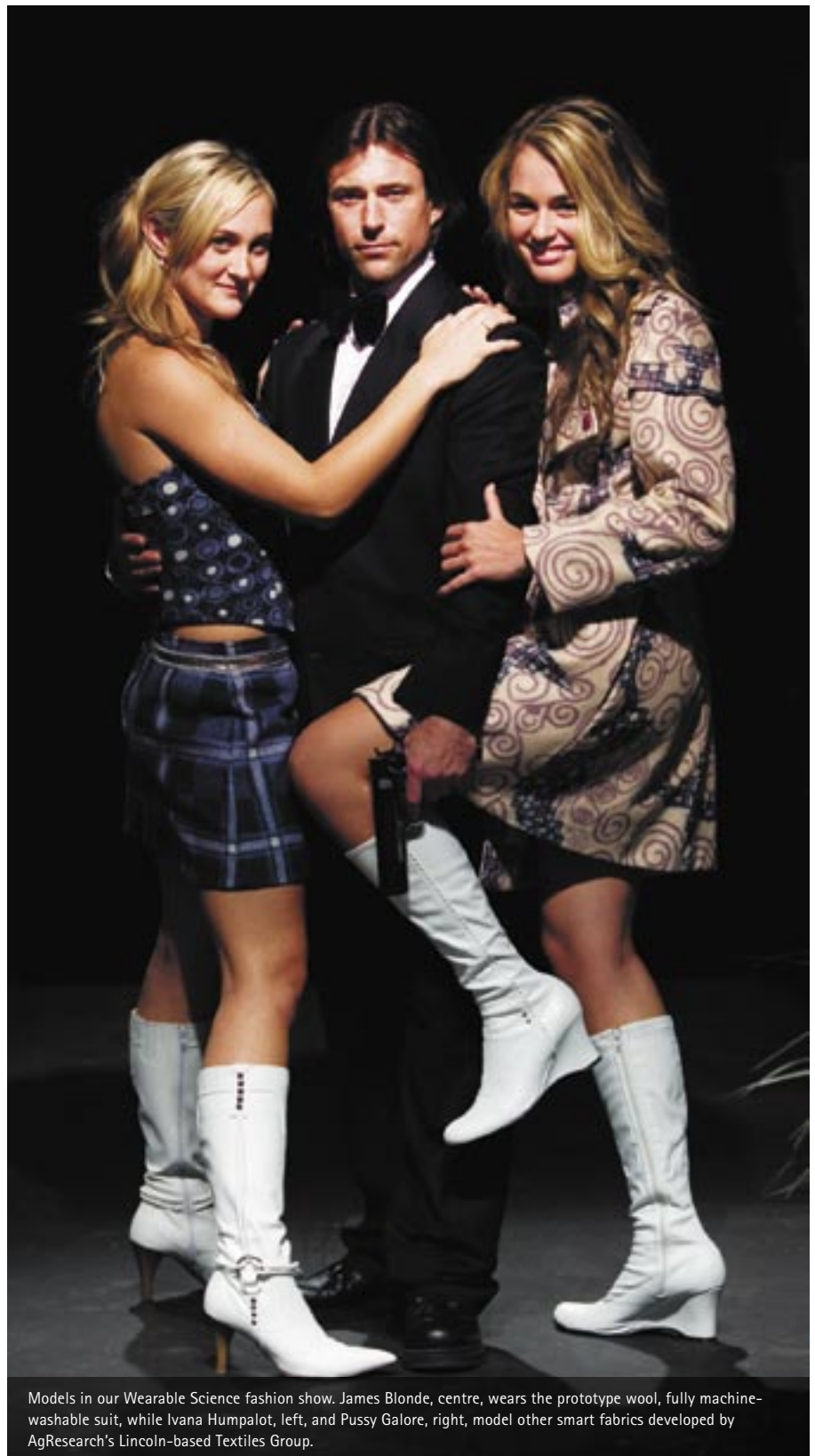
"The show was themed 'James Blonde – 007' and our model wore, under the wool suit, a SMART singlet that sends an emergency signal if the person wearing it is hurt, along with a stab-resistant and flame-retardant vest.

"While AgResearch is primarily at Fieldays to meet and talk to farmers about our research and how we can help them, we also had a number of commercial firms approaching us after they saw the innovative garments, as well as other major businesses coming onto our stand interested in working with us."

AgResearch further strengthened its support for Fieldays by announcing it will be the Premier Feature Sponsor next year, with the theme being The Science of Farming.

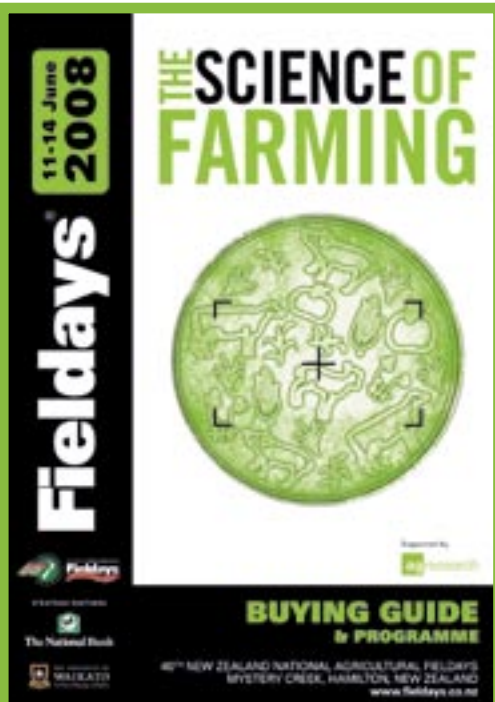
"This is the perfect fit for AgResearch. Over the past few years AgResearch has increasingly supported fieldays and as premier sponsor of next year's event we look forward to demonstrating how the science of farming is the path for the future of farming."

Don't forget to diary the public seminar series Lincoln HOT Science with Kim Hill: July 23 and 30, and August 6 at Christchurch's James Hay Theatre from 7pm to 9pm. HOT topics include water wars – the challenges of town and country, climate change, and our land of milk and honey – producers or polluters?



Models in our Wearable Science fashion show. James Blonde, centre, wears the prototype wool, fully machine-washable suit, while Ivana Humpalot, left, and Pussy Galore, right, model other smart fabrics developed by AgResearch's Lincoln-based Textiles Group.

AgResearch at Mystery Creek Fieldays



Highlights of AgResearch's 2007 Mystery Creek Fieldays — clockwise from right: AgResearch's stand focused on animal health research being carried out at the Hopkirk Research Institute; many visitors enjoyed the interactive touch-screen quiz; AgResearch's Dr Ian Sutherland, right, talks animal health with a visitor to our stand; from left, Minister for Agriculture and Biosecurity the Hon Jim Anderton, Fieldays President Rod Bryant and AgResearch Corporate Affairs Manager Allanah James announced AgResearch's 2008 Premier Feature Sponsorship; Paris, Fergie and Angelina helped demonstrate AgResearch's saliva test that identifies sheep with elevated levels of natural resistance to parasitic nematodes; New Zealand National Agricultural Fieldays' 2008 Premier Feature logo.



AgResearch collaboration with University of Queensland

The Prime Minister, the Rt. Hon. Helen Clark, has announced that AgResearch and the University of Queensland (UQ) will jointly fund a new Chair in Systems Thinking and Practice.

Known as the AgResearch Chair in Systems Thinking and Practice, the position will be established at UQ's School of Natural and Rural Systems Management, near Brisbane. The Chair will travel to New Zealand several times a year as part of the partnership, working with researchers from AgResearch and with key pastoral industry players and policy agents.

An international search is underway to recruit the Chair who will support both organisations in achieving an outstanding international reputation. The aim is to benefit Australian and New Zealand rural communities and national economies, to refine systems theory and methods to better solve complex problems in farming and agro-ecosystems, and to build

an appropriate systems culture and capacity in both organisations.

The Chair will have a strong relationship with AgResearch's Agriculture & Environment Group that undertakes research to primarily ensure the ongoing global competitiveness and vitality of New Zealand's pastoral industries. General Manager for the Group, Peter Benfell, says the position will help AgResearch deliver on its 2020 Science strategy.

"I believe UQ's systems research is of international standing and at the leading edge in Australasia. In addition, they have a very strong education programme that will up-skill our researchers and provide us with access to first-rate post-graduates."



Prime Minister, the Rt. Hon. Helen Clark, in Brisbane announcing the establishment of the Chair in Systems Thinking and Practice.

AgResearch's new engineering expertise

Following the acquisition of Canesis Network Ltd in January, AgResearch now has significant engineering capability at its Lincoln campus.

Under the guidance of Engineering Manager Steve Gebbie, the engineering team specialises in developing prototype machinery, and measurement and control systems. The workshop supports AgResearch research and development (R&D), often in conjunction with external clients, and it also carries out work directly for external clients.

The multi-disciplined team is able to handle unusual engineering requests, such as the refurbishment of a giant metal sculpture that featured on AgResearch's stand at this year's South Island Agricultural Field Days. The sculpture represented the parasitoid *Microctonus hyperodae* – typical of parasitoids being introduced to New Zealand by AgResearch.

"The range of work we've done goes from a \$1m, 100 tonne composting machine, to the development of a specialist instrument such as a stirrer, light box or controlled environment chamber," says Steve.

Electronics engineer Hong Zhang specialises in the development of measurement and control systems, and automation in radio frequency identification systems. Scott Sevier is the team's mechanical designer who uses Autocad Inventor as a modelling and drawing package.

"We find Inventor brings our models to life with computer-generated animation, and parts can be manufactured directly from the software using rapid prototyping technologies," says Steve.

Toolmakers Robert Wood and Graeme Jessep have a pragmatic approach to innovation

and operate an extensive range of equipment when developing prototypes. Registered electrician Bruce Jessep is responsible for all electrical design and builds, with his extensive experience proving invaluable in the production of commercial machines.

As manager, Steve provides design and estimating experience combined with project management.

"Typically the engineering team works hand-in-hand with the research scientists and engineers during the course of an R&D project and the interactive approach ensures the best ideas are identified and the gulf between theory and practical prototype is efficiently bridged.

"The engineering team quickly becomes an integral part of the R&D teams and this ensures the very best possible client outcomes."

Winner of the Ahuwhenua Trophy announced

Pah Hill Station, Atihau-Whanganui Incorporation sheep and beef farm, has won the Bank of New Zealand Māori Excellence in Farming Award for 2007.

As a gold sponsor of the competition, AgResearch congratulates the incorporation on its win, says AgResearch Māori Strategist Roger Pikia who was one of the three finalist judges.

"The competition rewards and promotes excellence in Māori agribusiness," he says.

"All three of the finalists were of an extremely high standard which made it very difficult for the judges to identify a winner."

The competition selects a winner based on such criteria as good governance and innovation, good financial performance, environmental management, and the contribution the winner makes to its community. Of the award's 10 judges, four were from AgResearch. Preliminary judging chose three finalists, one from each of

three regions, and the final round of judging took place last month during public field days on each of the finalists' farms. The winner received the prestigious Ahuwhenua Trophy, along with about \$40,000 in cash and farm-related prizes.

Roger says all contestants made significant improvements to on-farm productivity by adopting sustainable and profitable farm systems and implementing best practice governance procedures that inevitably leads to a stronger bottom line.

"The Māori pastoral sector has come a long way in a relatively short period of time since the competition was reinstated in 2003.

"With environmental issues and unstable returns from farming, the Māori pastoral sector has a better understanding of the need to achieve higher returns from land use, whilst reducing their environmental footprint. From AgResearch's perspective, it's encouraging to see contestants engaging organisations like ours to assist in this process and look at new opportunities for science to add value to their businesses. AgResearch wishes to partner with Māori to capitalise on new opportunities through the application of new or existing knowledge and technology."

AgResearch is committed to the competition and has been a gold sponsor of the awards since 2003, except for last year when it was a platinum sponsor.



2007 Ahuwhenua Trophy winners, Pah Hill Station, Atihau-Whanganui Incorporation, are pictured with the trophy. Back row, from left, are Averill Walker, AgResearch Māori Strategist Roger Pikia, AgResearch Chairman Rick Christie, AgResearch CEO Dr Andrew West, AgResearch board member Dick Davison, Incorporation Chair Whatarangi Murphy-Peehi and Incorporation Board Member Abe Hepi. Front row, from left, are Incorporation Board Member Dana Blackburn, Farm Manager Larry Walker, Incorporation Deputy Chair Don Robinson and Incorporation Board Member Toni Waho.

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Minister Maharey visits Lincoln campus

The Minister for Crown Research Institutes, the Hon Steve Maharey, found the heat was on him during a recent visit to AgResearch Lincoln.

He's pictured during a demonstration of heat- and stab-resistant fabric that has been developed by AgResearch's Textiles Group. The fabric is made from a lightweight wool fibre backed with a high-strength gel-spun liquid crystal polymer.

"This fabric can be used as protection in terrorism situations, yet it's lightweight and gives comfort not provided from the heavy flack jackets normally used in such situations," says AgResearch Senior Scientist Ian McFarlane.

Mr Maharey watched Natural Easy Care (NEC) fabric being spun at the campus Pilot

Plant before being presented with a business shirt made from the lightweight, pure wool fabric. He also saw a SMART Singlet that is being developed for potential use by the New Zealand Navy. It is comprised of Dyneema – the strongest fibre in the world – which is braided around a conductive filament. The yarn is knitted into a vest that is fitted with a RFID transmitter. If the yarn in the garment is severed by a bullet or shrapnel, the transmitter notifies the Bridge the wearer has been hit and appropriate steps can be taken.



Scientists prepare for Bird Flu threat

Twenty North Island farming families have been tested for avian influenza viruses to see if the strains can be passed onto humans.

Families in close contact with backyard flocks of domestic poultry, such as chickens, ducks and geese, volunteered for the study that aims to understand how the viruses move from wild birds to poultry, and possibly to humans.

By understanding the transmission pathways, scientists will be in a better position to stop the spread of fatal avian influenza viruses, such as Bird Flu, should they arrive in New Zealand, says AgResearch virologist Dr Tao Zheng, a member of the Animal Health Section.

"Preliminary laboratory screening tests based on blood samples taken from backyard chickens and ducks from about 25 flocks in the South Wairarapa and Bay of Plenty have shown evidence of potential exposure to harmless avian influenza viruses in some birds.

"We're now taking blood samples from the household members of the special interest farms, while sampling of their chickens and



Genna Flanagan, from AgResearch's Animal Health Section, gears up for sample collection from birds in the field.

ducks will continue at regular intervals for the rest of the year.

"Through this process we'll be able to identify risk factors that contribute to the transmission of the viruses from wild birds to the backyard poultry, and to their handlers."

When embarking on the project last year, the scientists knew wild birds carried harmless strains of the virus – in the past 15 years, 35 harmless viruses were found in wild birds in New Zealand. However, there was no evidence to show the viruses were in domestic backyard flocks.

Tao's group is part of a wider investigation team, with the project being a collaboration between AgResearch, Biosecurity New Zealand and Environmental Science & Research (ESR).