Playing a key role in lowering nitrogen

John Tanner is working hard to reduce the nitrogen footprint on his Canterbury farm, and he’s turning to genetic solutions from CRV Ambreed to help.

Tanner milks 730 cows at peak time on his 260-hectare Leeston farm in the Selwyn Waihora catchment near Lake Ellesmere.

It’s an environmentally sensitive area, with set nitrogen limits per farm. Tanner is making an effort to reduce Dunlac Dairies’ environmental impact and the farm was a finalist in the Dairy Business of the Year 2016.

“However, like many in the region, he is feeling the pressure. “We are trying to milk at our current numbers, but lessen our nitrogen footprint. So you are trying to do the same, but with less environmental impact.”

He believes science will offer a solution for farmers. When he heard about CRV Ambreed’s LowN Sires® bull team, Tanner was very interested, purchasing more than 200 straws.

The bulls are genetically superior for a new trait related to the amount of urea nitrogen in milk, and their daughters will have reduced concentration of Milk Urea Nitrogen (MUN). The genetic discovery could reduce nitrogen leaching on New Zealand farms by 20% within 20 years because cows bred for lower levels of MUN are expected to excrete less nitrogen in their urine.

“When CRV Ambreed came up with their LowN® bulls, we thought ‘we’ll have a go,’” says Tanner. “We have 730 cows and if we can lessen the nitrogen from the herd by 20%, then that makes a big dent.”

Tanner is interested to see how his herd’s genetics will improve over time. “I know it’s going to take a few years, but if it’s something that does improve nitrogen leaching from my cows, I will probably buy more straws in the future,” he says.

“We wanted the best in genetics, and CRV offered that,” says Tanner. “To also have the option to reduce nitrogen leaching is an added bonus.”

See more on LowN Sires® inside.
Welcome to our latest issue of It’s All in the Herd

What a year 2017 was! Major genetic discoveries, a new government, questionable weather and during all this, New Zealand farmers continued with their great work.

Our genetic discovery announced in early 2017 set the dairy industry alitlter and it’s been great to see the enthusiasm this breakthrough has generated. Our LowN Sires bull team has the ability to help reduce nitrogen leaching on farm, and our work in this area will continue with government funding for a major ($21 million) research project with industry partners.

Our initial research identified bulls whose daughters will pee out less nitrogen, lessening the nitrogen load on our farms and helping the industry with its environmental goals. This is a game-changer for the New Zealand dairy sector and at CRV Ambreed we’re proud to be leading the way on this.

As always, our field consultants, AI techs and supervisors, herd-tasters and many more great CRV Ambreed people have been on your farms, up and down the country to help with your goals of breeding healthy and efficient cows.

Enjoy this issue of It’s All in the Herd, and all the best for 2018.

Matt Macfie
Sales and Marketing Manager

CRV Ambreed’s genetic discovery already making an impact within New Zealand’s dairy industry

Environmental sustainability is key to our industry and the announcement of a major genetic breakthrough linked to lowering the nitrogen output of cows in their urine has made many headlines.

Since CRV Ambreed made public the major genetic discovery in March 2017, the dairy industry has been abuzz with talk of the potential lowering of nitrogen leaching through breeding.

Recently, the government announced it would help fund a large-scale, seven-year research project involving thousands of cows to further establish the effectiveness of breeding for lower nitrogen output. The $21 million project will be led by DairyNZ and co-funders CRV Ambreed and Fonterra, and will involve researchers from DairyNZ, Abacus Bio, A. L. Rae Centre for Genetics and Animal Breeding, AgResearch and Lincoln University.

Managing Director Angus Haslett says LowN Sires® has been well received by the industry and there’s strong recognition of the role science and innovation needs to play to move New Zealand ahead. “We consider it’s a game-changer for our dairy industry and we know it’s already resonating with farmers who understand the importance of using genetics to improve herds.”

He says the aim is to provide farmers with tools to help meet their environmental compliance through breeding – all within the standard AI mating programme. CRV’s research has further identified that when cows are bred for low milk urea concentration, a proportion of the nitrogen diverted away from the cow’s urea goes into milk protein, which will also increase the efficiency with which dietary nitrogen is used for milk protein production.

The search to understand precisely how animals partition the nitrogen they consume has been the subject of decades of research into making cows more efficient in the way they use dietary protein. The relationship between milk urea and the percentage of protein in milk identified by CRV Ambreed should give scientists new leads for that work. Therefore, not only can LowN Sires® and a low-MUN approach be used to breed for environmental gains, but also a potential increase in animal efficiency.

See more on LowN Sires®, pages 8–9

“We know it’s already resonating with farmers who understand the importance of using genetics to improve herds.”

CRV Ambreed Managing Director Angus Haslett
Meet a Progeny Testing advocate who says more farmers should get involved in sire-proving to help not only their herds but also the national herd.

Mike Tillemans has been part of CRV Ambreed’s Progeny Test Programme for many years and says it’s put him at an advantage when it comes to achieving the best herd possible.

Tillemans farms at Atamuri, between Taupo and Tokoroa, milking 450 cows at the peak of the season, on his 150ha dairy farm. He also shares milks 280 Jersey cows at a farm at Tokoroa, and has another dairy farm at Matamata.

He urges other farmers to get involved, not only to benefit their own farm business, but to benefit the national herd.

Progeny testing involves using semen from carefully selected, unproven but high-quality bulls for Artificial Insemination. Through herd testing and herd recording, CRV Ambreed can determine the bull’s genetic traits and advantages – while also improving the value of farmer’s own herd.

“I would recommend the CRV Ambreed Progeny Test Programme to other farmers because you can see the next generation of bulls coming through before anyone else,” says Tillemans. “It would be great for more dairy farmers to do it, because the more people involved, the more reliable the bulls will be.”

Tillemans says accessing some of the best dairy genetics in the country is one of the most appealing reasons to take part. The bulls are selected by the CRV Ambreed breeding team using genomic selection and their knowledge of the cows and their parentage.

In the programme’s 30-year history, more than 350 bulls have graduated from those young bulls that is sent to Progeny Test farmers such as Mike Tillemans (see story at left). Design was one of the 135 elite Holstein Friesian Jersey, and Crossbred young bulls to begin the Progeny Test Programme early in 2017. His traits show he has a high level of promise and genetic merit for farmers wanting to breed efficient and healthy cows. He is among the very best, with his genomic BVs showing he’s a high-indexing bull with extreme protein kgs, CRV Ambreed's global product manager grazling, Peter van Elzakker says. “His moderate size, huge output and high longevity values will make his daughters incredibly efficient. He also has superior udder BVs. Added to this, he is an A2A2 bull and will join CRV Ambreed’s facial eczema-tolerant bull team.”

Design’s sire, Mome Grove Hothouse S2F, is considered one of the highest-ranked outcross sires in the industry. His dam, Lornlace Mint Deva – ET, is also very well-known and was part of CRV Ambreed’s elite embryo transfer programme.

Design’s breeders, Adrian and Sally Henderson, of Lornlace Stud south of Putaruru, have contributed many bulls to CRV Ambreed’s breeding programmes over the past few years.

PT bull Design is now an InSire

Young Friesian bull Lornlace HH Design ET S3F (Design) joined CRV Ambreed’s sire-proving programme in 2017 and was recently announced as part of the latest team of elite “InSire” bulls.

InSire bulls are chosen on a combination of genomic data and information about their ancestry, and are set to become the dairy industry’s next superstars.

Every year, about 1,500 bull calves are offered to CRV and it genotypes the top 750 bulls by running them through a genomic selection process and an assessment by the breeding team. Then, 135 elite bull calves are selected for the Progeny Test Programme - and it’s the semen from those young bulls that is sent to Progeny Test farmers such as Mike Tillemans (see story at left).

Design was one of the 135 elite Holstein Friesian, Jersey, and Crossbred young bulls to begin the Progeny Test Programme early in 2017. His traits show he has a high level of promise and genetic merit for farmers wanting to breed efficient and healthy cows. He is among the very best, with his genomic BVs showing he’s a high-indexing bull with extreme protein kgs, CRV Ambreed's global product manager grazling, Peter van Elzakker says. “His moderate size, huge output and high longevity values will make his daughters incredibly efficient. He also has superior udder BVs. Added to this, he is an A2A2 bull and will join CRV Ambreed’s facial eczema-tolerant bull team.”

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Breeding long-term solutions for healthy and efficient herds

Working with breeders across New Zealand, CRV Ambreed is breeding for healthy, efficient, and easy to manage herds. Once people get involved with breeding, they become very passionate. We think that comes from the sense of achievement in producing quality cows and in understanding the critical role the herd plays in a farm’s success.

Genetics helps farmers with FE in cows

Facial eczema (FE) is a challenge for many New Zealand farmers. Affected cattle can suffer with skin irritation, damage to the liver and it sometimes results in death. FE also leads to a drop in milk production.

For farmers in regions prone to FE, it can be extremely frustrating – but genetics can offer a long-term solution. “We are highly prone to facial eczema here in North Taranaki,” says farmer Gary Phillips, who, together with wife Melinda, runs an organic dairy farm at Unenui, in North Taranaki. They have 160 milking cows on a 60-hectare farm.

Until about five years ago, they were badly affected by FE. More than one in 7 or 8 of their cows were developing the disease – which resulted in drying off stock early, and treating and sometimes culling affected cattle. “As a farmer, it’s very hard to deal with facial eczema in your animals. When one-third or one-half of the herd gets facial eczema, it’s one of the most devastating things you ever can see,” says Gary.

Facial eczema is caused by the toxic spores of a fungus, Pithomyces chartarum, which grows in dead litter at the base of pasture in warm, moist conditions. It is more prevalent in summer and autumn (January through to May) when grass temperatures and humidity is higher. When the toxin, sporidesim, is ingested by cows, it damages the liver and bile ducts, and also causes skin inflammation.

CRV Ambreed offers farmers a genetic solution with its stable of FE-tolerant bulls, which enables farmers to breed cows who are more tolerant to facial eczema.

The Phillips have been using CRV Ambreed’s FE-tolerant genetics with some of their cows since 2012. “When we were sitting down at the table with our CRV rep John Preece, we told him our biggest problem was with eczema and we wanted something to improve the cows’ eczema tolerance,” says Gary. “He said, ‘well actually, we do have something like that’. So, we signed up on the spot.”

The Phillips have now had three years of milking the progeny of sires with a tolerance to FE. “Everything seems to be working well,” says Gary. “We no longer have to treat those cows – our calves were being drenched regularly before, but the last three years we haven’t had to do anything at all to the eczema-tolerant animals.”

“We no longer have to treat those cows – we were drenching regularly before, but the last three years we haven’t had to do anything at all...”

The cows bred with FE-tolerance “didn’t get anything”, much to Gary and Melinda’s relief.

Gary says three years ago was a bad year for eczema in the region. “A lot of surrounding farms lost stock, but we floated on through.”

For the Phillips, their organic status was another reason to choose CRV’s FE-tolerant genetics. The farm at Unenui has been in Gary’s family for 103 years, and the farm has been organic for about six or seven years.

There is a sense of pride in their farm and its legacy, and knowing they are improving their herd for the future. “Using CRV’s genetics increases our cows’ longevity. There isn’t the same turnover in stock we used to get. We see it with our cows with increased FE tolerance.”
Meet the champion for LowN Sires®

Lynda Clark, an educator and businesswoman with a strong background in animal science, has taken on a key role with CRV Ambreed, promoting the LowN Sires® solution to nitrogen leaching to key industry stakeholders.

Clarket states sustainable farm practices and improving the quality of waterways are “hot topics.” “Farmers are using many management practices to reduce nitrogen loss, and LowN Sires® is another powerful tool! It’s “an easy, no additional cost and simple solution” to reducing nitrogen leaching on dairy farms, she says.

Clark taught animal science at Lincoln University for 16 years and was the founding general manager of Dairy Women’s Network. She also holds governance roles and works as a coach and facilitator.

On behalf of CRV Ambreed, she will travel the country to meet with large-scale stakeholders, including regional councils, large agricultural bodies and companies, and large farming trusts and corporations.

Daily Milk Urea readings could hold the answer to measuring cows’ nitrogen output, overtaking predictive modelling

CRV Ambreed says Milk Urea readings, supplied daily to most New Zealand dairy farmers, could provide a clear picture of exactly how much nitrogen herds are excreting each day in urine.

MUN is a measure of the amount of nitrogen contained as milk urea and there’s very strong international evidence of a direct connection between MUN and the amount of nitrogen excreted in urine when cows are fed varying diets - cows with low MUN excrete less nitrogen as urine. Calculations by CRV Ambreed show a reduction of 20% in leaching within 20 years is possible by using genetics to breed cows with lower levels of MUN.

Beatson says MU values for pasture-fed cows in New Zealand vary throughout the seasons but an overall drop of 2-3 points in MU values across the year would provide a 20% reduction in leaching. The average MU value in New Zealand is about 30 units, with herds spread anywhere from 20-40 units, he says.

“If we can use the bulk MU values available each day to know, reliably, how much nitrogen cows are peeing out, that’s an accurate picture for our farmers about the nitrogen load on their land. On the face of it, there’s very strong international and some New Zealand evidence, these bulk MU readings appear to give farmers a very good estimate of the nitrogen load excreted as urine nitrogen on a daily basis.”

Farmers can reduce their nitrogen leaching load on their land, she says. “I think we need to be able to put our hands on our heart, and say we are doing all we can to make a difference,” says Clark. “There is increased pressure on councils to improve the quality of waterways, and to be accountable. So, part of my job is to raise awareness of LowN Sires® and let them know more about this innovation, which has the potential to make a difference to farmers.”

CRV Ambreed Managing Director Angus Haslett says Clark is a great addition. “She brings to the role not only an understanding of animal science and the power of genetics, she’s skilled at talking to people, bringing people together and will do a great job at telling the CRV Ambreed story of better cows, better life.”

CRV Ambreed, with the input of other researchers, has spent five years investigating the genetics of Milk Urea Nitrogen (MUN). The rationale has been that if it’s possible to reduce MUN through traditional genetic selection means, and providing the relationship between MUN and the amount of nitrogen excreted in urine holds, then the genetically improved animals for MUN will excrete less urinary nitrogen and hence leaching per animal and per hectare can be reduced.

It’s estimated that farmers who include low-MUN in their breeding programme now add another tool to their farming systems to manage nitrate leaching and are looking at potential nitrogen leaching reductions of 10-12% by 2025. And it comes with minimal or no disruption to normal farm management practices.

“It’s an easy, no additional cost and simple solution to reducing nitrogen leaching on dairy farms.”

“EU COMPLETE”

EU REDUCED

NA COMPLETE

NA REDUCED

Zhai et al. (2005)

Nousiainen et al. (2004)

Kauffman and St-Pierre (2001)

Kohn et al. (2002)

(2021) MUN = 46% of MU

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Kadolph and St-Pailes (2001)

Nousiainen et al. (2004)

Kauffman and St-Pierre (2001)

Kohn et al. (2002)

Lynda Clark, it’s as easy as choosing this straw (of semen) over that straw.”

lynda.clark@crv4all.co.nz
**Helping farmers breed excellent heifers**

When Mathew Karl left his job as a bricklayer to become a dairy farmer seven years ago, it was one of the best decisions he ever made.

The 38-year-old is currently milking 300 mixed-breed cows on 100 hectares at Ohaupo, near Hamilton.

“He’s had fantastic results,” says CRV Ambreed Field Consultant for Te Awamutu/Te Pahu Debbie Young, who has been working with Mathew. “A lot of it is down to the effort he’s put in, he’s grown his cows beautifully.”

Mathew, his wife Kate and two young children love the farming life and are living on the farm Mathew grew up on.

He is particularly proud of his new crop of two-year-old cows. The 75 Friesian heifers, bred from CRV Ambreed genetics, are excellent, healthy milking cows, delivering good results. “Last year’s heifers produced an average of 17 kg MS/day, but this crop of heifers is at 18 kg MS/day and the top heifer is at 23 kg MS/day,” says Mathew. “They are doing really well.”

He’s particularly pleased with the excellent traits coming through, thanks to CRV Ambreed’s genetics. “The big thing is the udder composition. I think using CRV Ambreed genetics have worked, as the two-year-olds have got fabulous udders. I also like all the hooves on these girls, they sit right.” Ninety per cent culled in the first three weeks “which is a massive statistic,” he says.

Mathew has been with CRV Ambreed for four years, and says the advice and support he’s received has made all the difference. “With Debbie, it’s a lot more personal and that relationship is important, much more so than with other companies. She came and spent the time talking to me about what I wanted with the herd.”

**HERD TESTING INFORMATION BENEFITS FARMERS**

CRV Ambreed has appointed a new laboratory to enable New Zealand dairy farmers to gain access to further information about BVD and Johne’s Disease from their herd testing.

It has announced an exclusive arrangement with Disease Research Ltd, part of the University of Otago. New Zealand farmers can get their normal herd test information on Bovine Viral Diarrhoea (BVD) and Johne’s Disease (JD) but are now able to directly take that a step further with Disease Research Ltd.

Herd testing provides initial positive or negative result for these diseases through an ‘alert’ service. Now, the extended service offered by Disease Research Ltd provides farmers with the option of follow-up testing of individual cows, ensuring properly informed management and control.

BVD is estimated to cause annual losses for dairy farmers of about $127 million, and Johne’s Disease is thought to cost the country between $40 million and $88 million in lost production each year.

Dairy farmers will be able to access this extended service and information by herd testing through CRV Ambreed. The service now offers an initial status at herd level, through to individual cow testing at Disease Research Ltd.

Disease Research Ltd is the southern hemisphere’s only USDA-accredited laboratory with the ability to handle milk and serum samples.

Debbie visited Mathew at his farm to do a herd walk with him – and together they talked and made plans for improving the herd long-term. The first group of cows were inseminated in 2014, calved in 2015 and are now milking and having calves themselves.

Mathew understands that genetic gain is a long-term strategy, but is delighted that he is already seeing positive results with his heifers. “I look forward to what the next generation brings,” says Mathew. “That takes us towards the CRV message of ‘better cows, better life’ right there.”

“I look forward to what the next generation brings. That takes us towards the CRV message of ‘better cows, better life’ right there.”

**HERD TESTING INFORMATION BENEFITS FARMERS**

CRV Ambreed’s Estrotect Heat Detectors have been a successful product, says Mathew, who is using them for the fourth season. “I use them for pre-mating and I find they help us more accurately predict the best time [for artificial insemination] so we don’t go ahead too early. They are really easy to put on, and my staff find them easy to use.”

Mathew is also a fan of CRV herd testing, which is a valuable way for farmers to identify the high and low performers in a herd. And SireMatch has been valuable. “There is no guess work. It’s about giving things a go, and it’s pretty accurate,” he says.

**Thanks to our great breeders, here’s some top bulls producing fantastic progeny**

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Introducing the CRV Ambreed 

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