

# Effluent contains wealth

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Now that system four and five dairy farms account for 25% of the total, demand is growing for high profit, low footprint innovative management options.

These usually contain on/off paddock grazing options for cows to maximise pasture use, facilitate supplementary feeding, avoid soil damage and loss and use effluent in the nutrient management plan.

Specialists in the areas of herd housing, fertiliser, fodder crops and farm finance together with regional council officers explained their perspectives on high profit, low footprint systems to farmers at two Northland field days, at Hikurangi and Ruawai.

The Ruawai event occurred on the first, worst day of winter with horizontal rain and howling winds across the farm of Craig and Jane Sanford who milk 330 cows on 119ha. They have two HerdHomes which housed all of the herd for the day. They were built in 2008 before the Sanfords bought the farm in 2009.

They also grow 8ha a year of maize on the effluent irrigation area, make about 40ha of grass silage and buy in 100 tonnes of palm kernel.

The HerdHome bunkers are cleaned annually when dry in the summer at a cost of \$80/home for cleaning and muck spreading. Each home contains \$19,000 of nutrients which substitute for applied fertilisers.

Neil Crowson, senior technical sales representative for Ballance in Northland, told the field days that farm dairy effluent contained a wealth of nutrients such as nitrogen, phosphate, potassium, sulphur, magnesium, trace elements and organic matter with the quantities and the ratio depending on feed input, yard management and storage systems.

Effluent value from pasture-only cows could be calculated at \$33/cow while from high-feed input cows the value could lift to \$160/cow.

Effluent is defined by its total solids content and that determines handling and management options. Scraping and stacking is possible from 10% total solids and beyond.

Nutrients from liquid effluent are highly available when spread, whereas sludge or solids take time to release nitrogen and phosphate.

About half of the applied nutrients from more solid forms will be released during the lifetime of the first crop. Carbon in the bark stand-off pads also binds N so that availability is only one-third in the first year. Nitrogen and potassium are quite

mobile from points of placement whereas P is slower to move in the soil profile.

Maize grown for silage has a high nutrient requirement, being around 250kg/ha of N and K, 50kg of P and 30kg of S and Mg for a 20t/ha crop.

**'This is an opportunity for farmers to drive profits through environmental awareness.'**

Crowson said he now spends a lot of his time doing nutrient management plans with Overseer which use effluent saved from ponds or HerdHome bunkers.

"Depending on the type of effluent, the release rate of nitrogen has the potential to limit maize yield. Starter fertiliser is critical for placement of phosphate and providing an early boost to establishment," he said.

## A-maize-ing

Genetic Technologies forage products manager Dr Jakob Kleinmans said maize can be used to reduce nitrogen leaching because of its deep-rooting structure which pulls N and water from two to three times deeper than most pasture plants. Each tonne of maize silage drymatter removes about 12.8kg N, 2.6kg P and 12kg K.

"Maize has a nitrogen use efficiency approximately three times that of pasture and a water use efficiency more than double," he said.

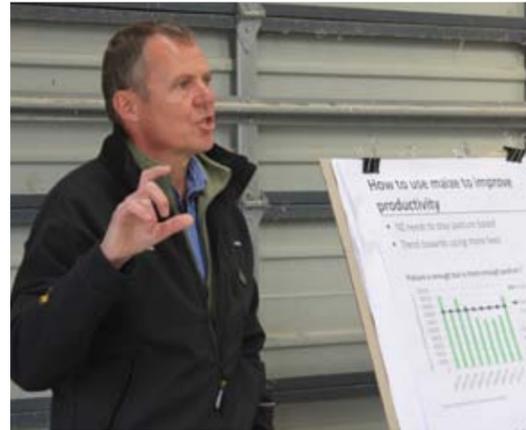
"Also, when fed in conjunction with high protein pasture, maize decreases dietary protein levels, resulting in less urine nitrogen excretion."

Maize silage should be used strategically to safeguard milk production in seasons which don't produce enough pasture for the herd size and the stocking rate, Kleinmans said.

ANZ Bank's Northland senior agri relationship manager Raymond Barnes said the global soft commodity opportunities for Australia and New Zealand over the next 40 years were huge. However, significant headwinds included capital requirements, skill shortages, land-use conflicts, unfocused research and development, rising supply chain costs and market access limitations.

To earn trillions of dollars more in exports before 2050, billions of dollars of domestic and foreign investment will be required, which will be facilitated by the bank.

ANZ has looked for and found more intensive dairy farms which have a low environmental footprint, Barnes said.



Jakob Kleinmans – maize is important in high-profit, low-footprint farm systems.

Production of 2000-3000kg/ha milksolids and a farm surplus of \$5000/ha and above are achievable in systems which have these key attributes:

- Full farm systems using modelling and advisors.
- Long lead times to intensification and for investments in stock and feed reserves.
- Ongoing capital planning including depreciation of assets and repayment of debt.
- Detailed investment planning and analysis, including understanding of return on assets.

"We have found these highly profitable farms are in a state of continuous improvement."

HerdHomes principal Tom Pow said dairy farmers are being told they will need to reduce farming activities to reduce their environmental impact, which is what markets are demanding here and offshore.

"Not so," he said.

"This is an opportunity for farmers to drive profits through environmental awareness."

It starts with soil care, avoiding compaction and pugging and their lasting effects on pasture growth. Pasture yields could be increased by 20-40% through thoughtful soil and pasture management.

Cows convert farm assets into income and profits and they should not be adversely affected by weather so that more energy is available for milk production. Effluent from those cows contained valuable nutrients and wherever possible should be returned to the paddock, not lost to the environment.

It also contained healthy bacteria, which some effluent treatment systems can kill.

"Off-paddock facilities need to be cow-friendly and staff-friendly and unhappy cows need to be removed from paddocks immediately, not in an hour," Pow said.



Neil Crowson – starter fertiliser critical.

The speakers agreed land values were increasing, partly driven by foreign direct investment, but farm productivity hadn't kept up.

**'Maize has a nitrogen use efficiency approximately three times that of pasture and a water use efficiency more than double.'**

"High profit, low footprint farm systems are essential so that NZ farmers remain in control of their own farms and can compete with foreign money," Pow said.

Northland Regional Council land management officer Bob Cathcart said it offered a free, non-binding and simple farm water quality improvement plan service and some activities might be eligible for money from the council's environment fund.

"Our greatest gains in improving water quality can be achieved by keeping sediment, nutrients and faecal matter in the paddock. Almost all of the phosphate ending up in streams is not in soluble form but bound to sediment, which is not from gross soil erosion but fine silt that washes off paddocks during rain.

"Avoid pugging and compaction and maintain a dense pasture and not only will you reduce run-off but also increase production."