75 YEARS
TESTIMONIAL

Selwyn & Gordon Taylor and Liam McMenamin

Dairy, **Carterton**
80ha / 72ha run-off (45 effective)
Regional Winners of the Best Dairy Award, Ballance Farm Environment Awards, 2002
16 years of dicalcic use
Application (once a year) 500kg/ha Dicalcic 10% Sulphur (0:4.3:0:10) + 500kg/ha Lime

'Up to the early 1990s we were farming the conventional way, using a lot of high analysis fertilisers,' recalls Selwyn. 'Come spring time, we'd have the farm shut up with plenty of grass available. The cows would go in and eat it all so we'd apply nitrogen to grow it again, which would cause the cows to scour, then eventually lose condition. We'd then fire on more fertiliser so the grass would grow to make silage. But that meant we'd require a large supply of bloat bullets, as well as a drum of bloat oil a month. If we weren't out in the paddocks checking the cows by 10:30am with our drench gun we'd begin losing them. We'd make the silage, but nothing would grow in the mean time, so we'd end up feeding it out early. We were double drenching magnesium as well because of the chronic grass stagger problem. In the autumn, the cows would be back on grass, but they wouldn't be milking right, they'd be skinny by the time we dried off, and we'd end up with a high rate of empties because they wouldn't hold that long. Then we'd start all over again . . . it was a vicious cycle producing milk.'

Right ▸
From left: Gordon, Liam and Selwyn

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Selwyn Taylor

We were getting high production at the time with 3.5 Friesian cows/ha, but we weren’t making any money because of all the extra costs associated with it. It wasn’t sustainable. For a month I began researching different fertiliser products looking for an alternative way, and that’s when I learnt about dicalcic. It sounded ideal. When we told the consultant about wanting to change to it, he strongly opposed the idea and warned us we’d go bankrupt. But we had nothing to lose.

Within three weeks of applying the first lot of dicalcic, we noticed the sickly yellow tinge disappear and the grass became a lot greener. The health problems changed quickly too. And over the period it’s continued to improve thanks also to the lower stocking rate and a change to the lighter Jersey herd. The breeding is a lot better, the bloat is down to about one case a year, and we haven’t had a case of staggers now for a long time. We’ve also stopped drenching all together, we haven’t needed to for years.’

‘Changing the health of the stock has helped make this operation more sustainable,’ says Gordon. ‘When we were running a higher stocking rate, there was more pressure on the cows, but lowering it to around 2.5/ha has meant we’re getting better performance out of each one now, as well as eliminating the stress. We used to go to discussion groups and our cows would be the top producing. We’ve dropped back a bit now, but we’re making more money.’

‘We farm here for profit,’ says Selwyn. ‘This was reflected at one point recently when our EFS was 10% higher than the top 10%. Naturally, the accountant has told us to carry on with what we’re doing and not to alter it.’

‘We don’t do any vet checks on the cows,’ says Gordon. ‘We achieved 97.5% submission under three weeks, and 100% in just under four. That’s with no outside costs. The empty rate on this place is now typically around 7%.’

‘The condition of the soil is hugely important,’ says Selwyn. ‘Normally after adverse conditions it bounces back well. This year was particularly bad, and if it wasn’t for the applications of dicalcic and lime nurturing the soil and maintaining a good structure, it would’ve taken a lot longer to recover.’

‘The drainage on this place is very good,’ says Liam. ‘Having a good soil condition means if there’s too much water, it will drain the excess away freely and keep what it requires. When the season gets dry, that stored moisture means we don’t have to crank up the irrigators as quick as other farmers around the district. The water is able to be stored down there, to be used by the plant.’

‘Our whole production revolves around growing huge amounts of clover,’ says Selwyn, ‘and the dicalcic and soil biology play an important role in achieving that. To help promote this further, we recently established beehives on an area of the farm for pollination. It also complements our philosophy of total sustainability. We’ve found we’re getting more consistent pasture growth, as well as better pasture utilisation. Milk solid production has increased about a third since we’ve been using dicalcic, with 92,000kg MS produced last year.’

‘We’ve created a great environment for the earthworms, bacteria, fungi, all the things under the pasture that help

with production,' says Liam. 'That's where we're relying on our clover to grow because that's where we get our nitrogen from. There's been no artificial nitrogen used on this place since starting with dicalcic.'

'Having plenty of earthworms is a big advantage,' says Gordon. 'On the run-off after a shower of rain there's a sea of vermacasts on the surface. This is perfect for recycling the litter left from the stock which is a great source of nutrients. We don't put much emphasis on the phosphate levels in our soil because there's no use having a large bank of phosphate sitting in the ground if you can't use it.

Hatuma have been excellent to deal with over the years. John Vaughan is always available to talk and gives us good advice on the products. With the emphasis on protecting waterways, and achieving better nutrient efficiencies, dicalcic's got a big future.'

Soil Report

Taylor's Farm, Carterton, 80ha (45 effective)
Dicalcic 10% Sulphur (0:4.3:0:10) @ 500kg/ha + Lime @ 500kg/ha

The Taylor's dairy farm epitomises the benefits of working with natural ecological processes within the farming operation. Shelter and food trees, mixed clover, ryegrass and herbal pastures, beehives and a thriving soil biology all contribute to the balance and productivity of the farm. Twenty years of applying lime and dicalcic phosphate has resulted in an environment that supports a high worm population (52 per 20cm cube, or 13 million per hectare), which is both an indicator of and contributor to good soil fertility.

Earthworms flourish in soils that have a near-neutral pH, have a continuous supply of available calcium in soil solution, have adequate phosphorus levels, have abundant organic matter, and have good moisture retention and drainage, good aeration and low toxicity. All of these are provided on the Taylor property: The pH is 6.5, calcium base saturation is 72%, phosphorus is applied in the neutral dicalcic form, organic matter is plentiful as a result of carbonates assisting photosynthesis and providing carbohydrate energy to the plant and soil systems, the deep well-structured topsoil provides good moisture retention, drainage and oxygen, and the safe soil conditioning products and rapid organic cycling ensure low toxicity.

It is important to note that, even when all the above conditions are favourable, earthworms are susceptible to variations in weather: drought, waterlogging, extreme temperatures and sunlight. Earthworms breathe through their bodies and are unable to conserve moisture. When conditions become dry and temperatures rise, the worms retreat deep into the soil, create a burrow and knot themselves into a tight ball, a period of aestivation where they neither move nor eat. Therefore, worm numbers will be low in summer, and it is best to do worm counts from autumn through to spring.

Healthy worm populations contribute to good soil physical properties (structure, moisture retention, drainage, aeration), and to soil fertility. Worms eat their own weight of litter and dung daily, processing it into nutrient-rich castings. The castings are high in colloidal humus, which provides safe forms of nutrients and improves the cation exchange capacity, or ability of the soil to retain nutrients until utilised. Worms have a high calcium requirement, as calcium is secreted by glands in the walls of the oesophagus, enabling extraction of a wider range of soil minerals.

A population of 13 million worms per hectare is estimated to produce 3,133 tonnes of castings per hectare per year, and 31 tonnes of nitrogen per hectare per year. Experiments have shown castings to contain 2-7 times more available phosphorus, 2-3 times more exchangeable magnesium, 1.5 times more calcium, 2-11 times more available potassium, and 4 times more available copper than ordinary topsoil.

Soil and plant tests on the Taylor property all show good ranges of macro- and micro-nutrients. The availability and balance of nutrients contributes to good pasture digestibility (72.7%) and high metabolisable energy (11.8 MJ/kg). Pastures are palatable, and the cows are not stressed, allowing their energy to go into producing milk.

Deep rich topsoil

13 million worms per hectare

Worms aestivating over summer-dry