It is not hard to find Mark and Lynne Peterson’s irrigation dairy farm, near Nathalia in north central Victoria. With 28,000 trees planted over the last twenty years, it stands out as a lush green oasis in the midst of farms that are relatively bare. The atmosphere created is one of life, fertility and lushness, surprising in a district whose long-term annual rainfall is only around 375mm.

Mark and Lynne supplied Demeter certified Biodynamic milk (along with several other Victorian Biodynamic dairy farmers) to Parmalat for over a decade. The milk was distributed widely in supermarkets until the long drought reduced supply and led to Parmalat stopping marketing it as Biodynamic, instead putting it in with their organic milk. Consumers were upset at losing their better tasting BD milk, and clamoured for a return of pure Biodynamic milk.

Mark and Lynne, after much research and discussion with Peter Podolinsky at the Biodynamic Marketing Company, came up with a solution: BD Marketing agreed to buy their milk at the same price as Parmalat were paying, pay a tanker to pick it up and transport it to a dairy factory in Kyabram and pay them to pasteurise and bottle it. BD Marketing would then distribute the milk through health food shops in Victoria. This was a risky project for the BDMC as they had to sell over 6000 litres a week to break even, but the company is there to assist farmers and consumers and often takes a “long term view” to facilitate BD produce reaching the consumer as efficiently as possible.

Mark’s father and mother bought the original 123 acre/50Ha irrigation farm in 1976. With several extra purchases the farm now totals 350acres/142Ha. During the 1983 drought, when times were very hard, Mark’s father bought a backhoe business and Mark became the share farmer. A few years before, he had completed a farm apprenticeship through Shepparton TAFE. In the third year of his apprenticeship, the instructor organised a visit to a Biodynamic dairy farm run by Maurie and Nance Fenell at Cogupna. He told the students that this farmer didn’t have any trouble with bloat, didn’t have to drench his cows, and didn’t have much mastitis. The other apprentices scoffed and said that this was not
Water pumped from recycling dam to irrigate paddocks

Paddock being flood irrigated

Newly sown paddock, new irrigation channel

Newly bought parcel of land. This will be used for young stock until it reaches Demeter standard

Well treed laneway

Plantain which came up after summer rain. Glow-green, upright, full of life. Relished by the cows.

Fescue and clover

New irrigation channel
possible, but Mark was intrigued, and asked Maurie many questions. Maurie was milking 60 cows on 50 acres/20Ha (with irrigation), and carried his replacements, only buying in a bit of hay and small amounts of grain. His cows looked magnificent, his pastures were lush and dense. This greatly impressed Mark, along with the fact that it was a more or less self sufficient, low cost operation involving no chemicals and virtually no fertilizer inputs. Later, in the mid 1980s, Mark and his dad watched A Winter’s Tale, the ABC TV feature on Alex Podolinsky and Australian Biodynamic farming.

Dairy farming margins were very poor at the time (as they are now), and Mark could see they were getting nowhere. He said he wanted to start Biodynamic farming, which seemed like a low cost, healthy alternative, and his father agreed. Maurie Fenell recommended he contact Trevor Cobledick¹ for guidance. He started spraying 500 in 1987, having found a second hand stirring machine and spray out rig. The effects weren’t instant, but crept up on them slowly. They made an initial mistake by stopping drenching their cows and calves straight away. The calves looked terrible after a while and Mark asked Trevor for advice. Trevor told him that you can’t just go cold turkey, but have to wean the animals off chemical drenches slowly. Trevor advised him to keep the animals moving through a good pasture rotation. Mark drenched the calves and they got through OK. The milkers didn’t need drenching, however.

After three years of Biodynamics, (during which Mark and Lynne bought the farm) the calves (which looked very healthy) were tested for worms. The reading was so high the vet rang and said Mark should drench them immediately. He asked Trevor what he should do. Trevor said “what would you have done if you hadn’t seen the test results?” Mark said “nothing”. Trevor said “well do nothing and see what happens”. So he did nothing. A few months later, after another test, the vet said “so you drenched those calves?” Mark said “no”. The vet was amazed, as the calves, apart from one or two, had almost non-existent worm counts.

After 23 years of Biodynamics, Mark and Lynne’s soil has changed from a red loamy soil only a few inches deep, with clay underneath, to an almost black topsoil which extends to 450mm depth. This has puzzled marking. Perennial pastures comprise rye grass, white clover, paspalum, chicory, plaintain and many other lesser but nonetheless important species. Annual pastures include sub clover, Persian clovers, Shaftal, winter active fescues and others, again on a rye grass base.

Mark is very impressed with modern winter active fescues. They are tricky to establish, requiring a fine seedbed, no competition while they are young, and careful grazing, but once established they persist very well and are very hardy. They are also more palatable for dairy cows than older, rougher leafed varieties. Once established, and oversown with subclover, the pasture will last for 15 years with careful management, and not overgrazing.

Over-sowing existing pastures is used extensively to re-establish species after drought or to rebalance pasture composition. Perennial pastures are oversown every 3 years or so (mainly with rye grass).

Mark has learnt that when ploughing up a paddock using the Rehabilitator plough, it does leave the ground quite soft, and it is often best to grow a cereal crop in the first year before re-sowing to pasture and grazing. If sowing fescue, it requires a fine seedbed on top, dropping the tiny fescue seed on top, pressing it in with tyres and getting it well established before grazing it.

Provided enough irrigation water is available, Mark plans to start green manuring a paddock or two each year to really intensively improve the soil.

Pastures are harrowed after the cows move on, to spread the manure evenly. Mark uses a very wide set of pasture harrows and can do a paddock in 15 minutes or so. The best time is in the morning while the dew is still on the grass.

Weeds are generally not a problem. Some species that are regarded conventionally as weeds are actually relished by the cows and are highly nutritious under Biodynamics. A few thistles come and go. They are opportunistic weeds that come when soil is disturbed, and don’t like irrigation or competition. They do their job and then disappear. Paterson’s Curse (toxic to cattle)

¹ BD cattle and grain grower, Nathalia. Mark also got a lot of valuable advice early on from BD dairy farmers Don Rathbone and Evan Hardy.
is hand pulled if it appears anywhere. Bindii’s come in on trucks and milk tankers, but again they don’t like competition. Manure harrowing plays a very important part in weed management as cow pats left in place acidify the soil and weeds come to balance the problem.

**Irrigation**

Irrigation water comes from the Murray irrigation scheme. Each paddock is laser levelled, and flood irrigated through timer controlled gates. After leaving the paddock, the water returns to a recycling dam from where it is pumped back onto paddocks. During the drought, allocations fell as low as 35% but with good winter, spring and summer rainfall, next irrigation season is looking much better. Under the new rules for water trading, farmers can buy water and carry it over to next year, which gives them much more control of their situation. While Mark is not particularly happy to see irrigation water diverted to Melbourne, he recognises the necessity of the irrigation system upgrade the Victorian government is undertaking, and the benefits that will flow from that. When the water is available, Mark irrigates every 10-14 days (conventional farmers irrigate every 7 days). However, during the drought the subsoil dried out so much that he had to come back to every 9 or 10 days.

**Rotational Grazing**

Alex Podolinsky has stressed the importance of good rotational grazing and strip grazing for over 60 years. Mark and Lynne’s rotational grazing set up evolved over time. On Maurie’s advice, together with their own experience, they now have the young stock, the dry cows and the milkers on three separate rotations, in three separate areas (Maurie’s set up, on his tiny, triangular shaped 50 acre farm, reminded Mark of three cogs going around together.) Under this system, each group gets fresh grass, and doesn’t have to follow another group, with worm implications, and also eating the best grass lower than ideal while leaving the not so good grass.

Mark did a pasture feeding course where he learnt a lot about the exact optimum stages of grass growth. They have a total of 70 paddocks, many of which are around 3 hectares or even less in area. Each paddock is strip grazed with electric fences. Mark has two electric fences in the paddock, so that he just drops one when the cows need to be moved, and they can run straight in to the next bit. With strip grazing he can get almost twice the feed out of a paddock and has so much more control than if the cows were given the whole paddock at once.

Optimum height after grazing is 4-6cm (2 inches). If the cows start to wander back and eat the regrowth (back-grazing) you have left them there too long. Back grazing sets the grass back badly. Optimum height before grazing varies with the time of year and the species involved. The predominant grass, rye grass should ideally be at the three leaf stage. Once the fourth leaf starts to grow, the first leaf dies. However, in spring, this doesn’t apply, as the grass grows so much more quickly, and can have five or six leaves.

Mark doesn’t look too far ahead of the milkers – he looks at where they are going tomorrow and where they were yesterday to determine how the rotation is going. If you are moving them too quickly, you can cut the paddocks into four instead of three, add more hay or silage, or, for instance, graze pastures until 11am and then put them in a non-pasture feeding area with hay and silage. You have to get the balance right between what’s good for the pasture and what’s good quality feed for milk production. In spring the rotation may be down to 20 days, and in February, when the paspalum takes off, it may go down to 15 days. Paspalum mustn’t be allowed to get away too much. For one thing it makes oversowing very difficult, and this year, with summer rains, Mark had to top the paddocks and rake the paspalum off to the sides so as not to block the sowing machine. In winter, the rotation may go out to 90 or 100 days. Mark has a very good computer program to help with rotational planning – he enters a rating for each paddock (poor, good, excellent etc.) and the program calculates how many feeds you will get from it. It is very much dependent on the farmer’s observation and assessment of the pasture. It was a good training tool for a few years but now Mark knows instinctively how to manage the rotation. However it will still be useful when they go away, for their relief worker to accurately manage the rotation.

**Fertilizer Inputs**

Mark applied no fertilizer for twenty years, but because of the long years of drought, has, for the last few years, applied 50kg/Ha of guano with the seed when sowing annual pastures, just to give the seedlings enough of a “lolly” to get going. He doesn’t use any lime – soil tests always come back with a good pH reading.

**Compost**

Mark makes and spreads 120-150 tonnes of BD compost every year. After milking, he pushes the manure off the yard into a holding pit, using a rubber scraper that fits onto his four wheeler bike. A little straw is thrown over the manure each day to protect it from drying out. Every week, he empties the pit, taking the manure to the compost area. When enough material is built up, he will make a large BD compost heap. He makes three or four heaps each year, spreading the compost at the rate of 5-8m³ per acre (12-20m³/Ha).

Mark turns the material several times while it is building up, by pushing it over with the front end loader. He keeps it at no more than 60cm in height to avoid it heating up before the heap is built. By the time he is ready to build the heap the material has been well mixed already. He uses a Krone manure spreader with a metal cowling over the beater blades to build the heap, moving forward progressively as it comes up to height.
Manure scraper, easily attached to 4-wheeler bike

Dairy yard. Cereal hay for cows to pick at while waiting to be milked, manure collection pit (top centre)

Krone manure spreaders

Mark monitors the temperature carefully, trying to avoid temperatures in excess of 45°C. Only when the temperature drops to 35°C does he order the BD compost preparation. He makes sure that the preps are inserted in the heap within a few hours of them arriving in the mail. Even after the preps are in, Mark only covers the heap with straw or old hay in stages from the bottom up. He feels that in this way, heat can escape more easily. Only when he is satisfied with the temperature will he finally cover the whole heap. In this low rainfall climate, he leaves a 60cm wide flat top on the heap to allow rain to get in.

When deciding when to spread the compost, many factors have to be considered: what will the weather do, what’s the grass cover, when will the next irrigation water come? If a compromise has to be made, Mark prefers to spread when the compost is a few weeks off being mature rather than a few weeks after it matures. He has noticed that, even if there are still some green bits in the heap, by the time it is carted to the intended paddock (by truck) and dumped in a heap for a few days, the extra aeration finishes it off quickly. Mark drives the manure spreader up and down the paddock (metal cowling removed) and on each run, his father drops a front end loader bucket in. This way, the spreader is not put under undue strain by carting a very full load to the paddock and spreading it, and the weight on the pasture is minimised. The pasture should have a good grass cover (100-150mm), the compost should be spread in the late afternoon, and the paddock is irrigated soon after spreading. Good grass cover helps shade the compost, and irrigation helps it incorporate with the soil.

Mark arranges things so that straight after spreading one compost heap, he builds the next one, while the spreader is still dirty. After building the heap he hoses the Krone down thoroughly (it should ideally be shedded for longevity).

Trees
The 28,000 trees planted are all natives. The first plantation was of eucalypts from northern New South Wales, which suited the warm climate and irrigation water, but when water became scarce during the drought, they struggled. Later plantings were of trees from the local area that suited the Superb Parrot, a beautiful but endangered species. The Petersons are hoping to attract them to their property, and help establish links to the Barmah State Forest habitat. In hindsight, they would have planted a higher percentage
of understorey species and fewer eucalypts. In drought times the larger eucalypts compete with the pastures and some plantings have had to be thinned. Not only do the tree plantings provide shelter for stock and pastures, and bring nutrients up from deep in the subsoil, but they also provide all the Peterson’s firewood requirements - they will soon also be able to sell firewood.

**The Herd**
Mark and Lynne milk a mixed herd of mainly Jerseys and Friesians, resulting in milk with about 5% butterfat. Mark intends to increase the percentage of Friesians over the next few years to lower the butterfat levels as some people don’t like their milk to be too creamy (though a low-fat milk is also produced at the dairy factory).

When Maurie and Nance Fenell retired they helped the Petersons purchase their Jersey stud herd as they wanted the cows to go to a good home. Their predominantly Friesian herd was culled heavily to introduce the new cows, which, being from a Demeter certified property, could fit straight into the milking program.

Because Mark and Lynne are the only farmers currently supplying Demeter certified BD milk for Victorian consumers, the pressure is really on to produce the highest quality possible with very even production levels. They have now moved to three calvings per year, in March/April, July/August and November/December, which makes it very hard to organise a holiday. They are taking on a farm apprentice soon, and, down the track, that will ease the situation.

Breeding is three quarters A.I. and one quarter natural. They are using mostly A2 2 bulls as many consumers are now asking if their milk is A2. Mark estimates that their milk is now 2/3 A2, and this will increase each year. They choose bulls for medium stature and ease of calving rather than high production. Mark generally has to help only one cow per calving group, generally a turned foot or other simple problem. Calves for replacements come from the March and July calvings only, as summer calf rearing is too difficult in the hot climate.

Apart from grass, hay and silage, Mark and Lynne feed cereal hay and a little grain. Mark likes grain as a way of getting the cows into the shed and as a supplement to their diet, but not in large quantities. In winter he will feed a couple of kilos per cow per day (up to 3-4 in the drought when feed was very scarce), but when grass is growing well he cuts back to a kilo. All feed that is bought in is from Demeter certified BD farmers. During the drought, when feed became very scarce and expensive, Mark found that buying water to grow more fresh grass was actually more economical.

The cows and calves are remarkably healthy and free of problems. Drenching is not necessary and antibiotics are never used. Over the years, animals that have problems are culled, so a strong herd has been selected. Cows are never brought in from outside the system (heifers occasionally are). Bloat is very rare, despite no preventative treatments. Mark has lost only two cows to bloat in twenty years.

Milk fever is uncommon and getting less and less. Mark takes the cows off pasture a few weeks before calving and gives them plenty of cereal hay and a little bit of grain. If milk fever occurs, it is usually in older cows, and Mark is able (under certification standards) to use a calcium injection to cure it. Cows are dried off by stopping milking. Dry cow treatments are never used.

Mark has to watch somatic cell count carefully to maintain the high standard and unusually long shelf life of the milk. Udders are not washed unless dirty. Small amounts of dirt are wiped off with paper towelling. If a cow has gone down in the yard, the udder is washed and usually dries off by itself in summer. In winter, paper towel is used to dry the udder. Teat spray is made up with 40mls of BD tea-tree oil in 25 litres of water with 3 litres of glycerine (glycerine helps soften the teats).

The cell count is usually around 200 (industry standard is 250) and very little mastitis occurs. When it does occur (usually in older cows), if in a late lactation cow, she will be dried off. An older cow might be culled straight away. Younger cows will generally fully recover. An older cow may subsequently have a dry quarter and be milked as a three titter, but if she gets another bout of mastitis she will be culled.

Sometimes a cow will develop a sore foot. Mark first cleans it out with a brush and water. One in ten will have a stone lodged which caused the problem, but if it is an infection, he presses copper sulphate into the foot and then tapes a kitchen cloth packed with copper sulphate and rolled into a cigar shape between the claws. He tapes diagonally from the claw to the top of the foot, not around the ankle as that restricts blood flow. The dressing is removed after a few days. Bad cases are kept in a small paddock near the yard to save them walking for a few days. Foot problems can be associated with feeding higher levels of wheat. Barley and triticale don’t cause problems, and if Mark has to use wheat he will combine it with other grains.

As to fertility, very few cows fail to get in calf and Mark doesn’t have to cull for fertility issues. Fertility is partly related to the higher levels of selenium in Biodynamic cows. In any case, with three calvings a year, a missed pregnancy can soon be rectified.

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2 Milk today contains more than one type of beta casein protein, but originally all cows produced only A2 beta casein milk. There is some evidence that A2 milk may be more digestible for many people.
Mark and Lynne are currently milking 120 cows as they are only just coming out of drought mode. They are carrying many young stock as they build up the herd again, and aim to build up to 200 milkers plus carrying replacements and growing most of their hay.

### Milk Production

The cows are milked in a 12 aside herringbone dairy, and produce 5000-5500 litres each per year. This is relatively low compared with cows on conventional farms, but they are smaller bodied and cost much less to feed than the very large cows on many conventional farms. They also have a much longer productive life than conventionally farmed cows. The milk is also of much higher quality, having been awarded an exceptionally long shelf life by the dairy factory and having won *The Age* Epicure section blind taste test in which a panel of expert tasters compared milks available on the Victorian market. It was the only milk to be awarded the rating of Outstanding. Many consumers have reported that it is the only milk they and their children can drink without suffering from bronchial and ear infections.

Currently, the Petersons send 12,000 litres of milk per week to the dairy factory, 10,000 of which is marketed as Biodynamic (and growing). They have fortunately retained their high per litre payments despite the world economic downturn, which has drastically affected most Australian dairy farmers’ incomes. The Biodynamic Marketing Company is currently looking at sending the milk interstate as well, and, if demand rises sufficiently, two or three other BD dairy farms will send their milk too, resulting in considerable cost savings.