

Biodynamic Grains and Pulses



Barry Bowden in 40 acre Kemut (old Egyptian wheat variety) crop

Barry and Lyndell Bowden farm “Koolami”, 710 acres of deep, black volcanic soil at Pampas near Toowoomba in southern Queensland. They grow a range of grains and legumes Biodynamically, including wheat, rye, buckwheat, sorghum, mung beans, chick peas, soy beans and sunflowers. Two very old varieties of wheat are grown, Spelt and Kemut, both of which are in great demand as their gluten structure is different from that of modern wheats and many people who have trouble with wheat flour can digest products made from Spelt and Kemut.

Barry was born on a farm, and farmed conventionally with his father for years. When he bought his own farm, he started to seriously question whether conventional agriculture made sense. He looked at the enormous cost of fertiliser and chemicals, his long term health prospects, the effect of chemical farming on the soil and the environment, and the quality of the produce. When he weighed it all up he couldn't see any alternative to going organic. Fourteen years ago he visited an old farmer on similar soils near Dalby, who had never adopted chemicals, and was still following old organic methods, incorporating cattle into a rotational system

called ley farming. Barry saw the value of this system and adopted it.

There wasn't much information available on broad acre organic farming, but after much reading, Barry found some material on Biodynamics. He wrote a letter to Alex Podolinsky, started gathering the necessary equipment, and made a start. The soil is one of the best in Australia, up to 3 metres deep with underlying brown friable clay that goes down another 5-6 metres. It has enormous moisture holding capacity. It is also self-mulching – the top crusts and lifts a little, mulching the soil underneath. However, after years of conventional farming, it was compacted, and would crack badly – 75-100mm wide and over a metre deep. It tended to be cloddy – if you threw a clod at a wall it would smack like a stone and not break up. After farming organically for 18 months, no substantial changes were noticed, except that production dropped off a bit initially. Barry's mindset was still fairly conventional and input oriented – he applied rock dusts and foliar sprays.

When Barry started using 500 twelve years ago, everything seemed to kick into gear. Barry noticed a change within 6 weeks of applying the first 500 spray –

he ploughed a paddock, spraying 500 at the same time. There was no rain for 6 weeks, and when he went to look at the paddock, he was amazed to find that the soil was fine. This had never happened before – normally he would have to mechanically break it down to seed bed fineness. The soil began to smell sweeter and become less cloddy – now if he picks up a lump of soil and throws it, it breaks up in the air. The cracking has almost disappeared. When I visited in October, and walked over the sunflower paddock, it was like walking on a soft mattress. Barry dug down 300mm into the well structured, rubbly soil with his hand, and could have kept going.



Kemut heads

Barry uses no fertiliser at all on his farm, the only input being prepared 500. He was initially concerned that 500 application might not be feasible because the soil is often too wet to drive on without getting bogged, and when it does dry out enough, the surface is too dry for 500. After talking with Alex, Barry developed his current method of spraying 500 while ploughing ground (500 is applied to the whole farm once a year). He is working towards a system where he will plough, sow and spray 500 in one pass (the soil is now so well structured that only light tillage is required to open the soil for sowing).



60 acre paddock of Spelt



Spelt

501 (the light spray, used to bring more light when there is too much moisture or fertility, and too little sun) is never needed here. The sun in Queensland is very intense. Even in winter it is not an issue - although overnight temperatures can go down to -14°C with severe frosts, the sun comes up and the daytime temperature will go up to 18-20°C. There has only been one very wet winter in 12 years where Barry could have safely used 501 without burning the crop off.

The whole farm is undersown to snail medic, a very useful legume that can spread a metre square, and has large snail shell shaped seed pods. It comes up of its own accord but doesn't out-compete any crop. On its own it can form a very prolific pasture 600mm high. Last winter, Barry had 60 head of cattle on 100 acres of snail medic all winter, and they seemed to make no impact on it at all! Its only drawback is that it forms a dense ropey mat that no tyned implement can plough. Barry lets it grow 600mm high as a green manure then either runs discs (set at 25mm depth) through it to cut it up, slashes it or puts the cattle on it before chisel ploughing.



Snail medic seed pod

Weeds are dealt with by light tillage after the crop is up. False seed beds are not possible because of the erratic nature of the climate over recent years – when the



Planter

moisture is right, crops have to be planted straight away. If Barry ploughed and got the weeds, there might be no more rain for sowing for months and he would miss out on the crop altogether. Wild turnip is the worst weed, and has now acclimatised to come up in summer as well as winter. Barry takes the straw spreader off the header and drops all the straw in a row behind it – any wild turnip that germinates dies under the mulch, and it is also easier for the cattle to eat the straw this way. Barry is going to try planting a crop of canola (same family as wild turnip), letting it start to flower and then ploughing it in as a green manure crop. The idea is that weeds come to redress some imbalance in the soil – if you plough them in as green manure, it gives the soil what it needs and takes away the need for that weed to come.



Sunflowers, spaced widely for hulled seed production

The seasons have become much more erratic – instead of general steady rains in winter plus storms at other times, the pattern is becoming storms at any time, which are patchy, so that one farm might get good rain and another 5 miles away might get none. The last 5 years have seen much lower than average rainfall, as in many other parts of Australia. Last September, though, he got 5” of rain and it kept on raining. He harvested a bit over a tonne of wheat to the acre, and a tonne of Spelt to the acre, which is one of the best Spelt yields he has ever had.

Old thinking on when to plant has to be reassessed as the rainfall pattern changes. Barry is now prepared to plant earlier than in the past, otherwise sometimes he would miss out on a crop. This year he planted Spelt and Kemut in May. Spelt and Kemut are much more accommodating than more modern wheats. Rain near harvest can damage modern wheats but Spelt and Kemut are much hardier, and will just produce more. Growing a range of crops is a help because if you miss out on planting one, you have another with a different planting time as a backup. Buckwheat is a useful crop because in recent years the area has been missing out on summer rains as well as winter rains, but getting good rain in February – this is too late for all crops except buckwheat. Buckwheat is also easier on the soil than sunflowers. If Barry could find a way of dehulling it he would stop growing sunflowers.

Barry uses the 60-80 head of cattle as a rotational tool, and to clean up crop residue after harvest, including straw. They help with the weeds too, especially in a dry year. When the cows are cleaning up a crop or reducing a green manure before ploughing, they compact the fluffy surface soil (an ideal seedbed for weeds) and make it harder for weeds to germinate. They also drag their feet through the soil as they walk, killing young weeds.

The basic rotation system is two years summer crops and two years winter crops, and always following a cereal with a legume. The fifth year is temporary pasture of snail medic, forage sorghum or lab lab, and grazing with cattle before starting the cycle again. This suits Barry's excellent soil. A poorer soil would, of course, require a longer break under pasture.

Barry is always looking for ways of improving his farming system. He is now looking at “tram-tracking” whereby the tractor always runs in the same tracks when preparing and maintaining a crop, thus keeping compaction limited to those tracks. After the crop is harvested, the tracks are ripped with Yeoman tynes. A further development of this method is “ridge-tilling”, where the tractor runs in furrows between ridges. When you plough, you only plough and sow in the tops of the ridges. After harvest, the stubble is slashed and falls into the furrows to compost there. If there is heavy rain the furrows hold the water, and also the crop is up out of the water. At present Barry grows on the flat and just leaves the stubble alone.

Red Gum Flour Milling

Barry started milling his grains 5 years ago and marketing them under the brand *Red Gum Flour Milling*. He produces buckwheat flour, chick pea flour, millet flour, light wholemeal flour, wholemeal Spelt flour and white Spelt flour, as well as wheat flour.

He made the mill, sifter and many other pieces of equipment himself. The mill is a one metre granite stone

mill. The demand for Red Gum flour is growing at such a rate that he is building a new shed and organising a roller mill. The stone mill is slow, only doing about a tonne of flour in a 14 hour day, and many bakers prefer roller milled flour because it is better for baking. The stone mill is run seven days a week at times to keep up with orders.



Air-tight silos

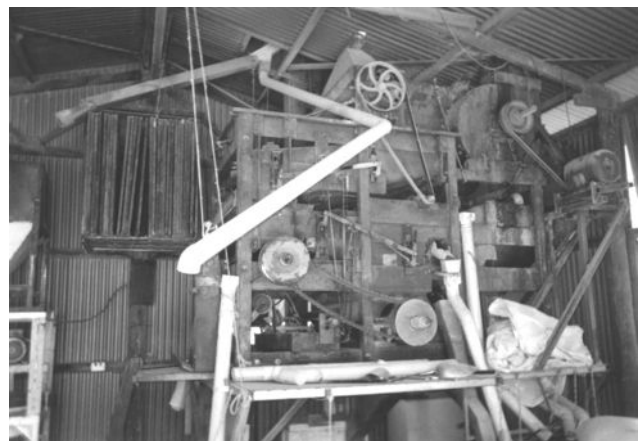
The stone mill crushes everything up small, including the bran – the small particles of bran interfere with the long gluten strands and breaks occur. With a roller mill, the bran is shaved off in big flakes, and the gluten strands can form around the sides of the bran flakes. The bran is also easier to sift off for lighter flours. The roller mill has four rollers which mill the flour progressively finer, and there are sifters at each stage so you can produce semolina (for pasta makers), coarse flour, fine flour, pollard or bran if required. And because Barry will only use it in batches of one or two hours at a time, overheating of the flour will not occur. He will still use the stone mill to produce stone-ground flour.

The grain is stored in a series of large, airtight silos. If a silo is washed out just before filling with grain, and sealed straight away, there are no problems with

weevils. If necessary, though, CO₂ gas can be introduced into the airtight silo to prevent weevil infestation.



Stone mill and sifter



Grain cleaner

Barry respects what Alex Podolinsky has done for the development of Biodynamics. Some people don't like the fact that he is strict on the correct application of the method, but Barry says you only have to look around at the other Biodynamic and organic systems to see that there is a lack of understanding of proper rotation and Biodynamic principles. If we make changes to the BD system without a deep understanding of what we are doing, we can easily make it less effective. Barry also appreciates that Alex insists on the farmer becoming active in learning and understanding what's happening on the farm, and developing the best system for his or her particular soil and nature environment.

Barry feels that his farm still has another 10 years at least to be near its optimum development. He has developed what he sees as a sound rotational system, which is the bedrock of natural farming, but is always looking for ideas that could enhance it further. The Australian Demeter Biodynamic method is the catalyst that really makes it work.