

## KOWHAI FARM

### Key points

- Kowhai Farm, Heinz Wattie's organic farm at Lincoln University, is a 57 ha certified organic mixed cropping enterprise, producing organic crops and livestock.
- Prior to conversion to certified organic production the property had been run as an intensive cropping operation and came with relatively poor soil structure, and a high weed burden.
- Kowhai Farm has now been operating for 8 years and returns are similar to that of a conventional cropping farm.
- Yields from the organic crops are often slightly less than conventional crops but organic premiums more than make up for this. In many cases crops have yielded above average conventional yields, enabling the farm to significantly profit from the organic premiums on offer.
- Weeds are the biggest issue in organic cropping at Kowhai Farm.
- Cultivation is heavily relied on for weed control, and hand weeding is also required in some crops.
- A restorative pasture phase of 2-3 years is used to rebuild soil fertility and structure depleted by cropping, and also helps to deplete the weed seed bank.
- Organic livestock are brought in, as required, from another organic farming operation.

### Background

Kowhai Farm came about after talks between Heinz Wattie's (HW) and Lincoln University (LU) in 1998. HW was keen for an organic demonstration farm because it had unsatisfied demand for organic produce and hoped more conventional farmers would convert to organics. LU was interested in a research and teaching farm. The 57 ha site, part of the LU cropping farm, was leased to HW in 1999 and the conversion process began, aiming to create a commercial scale research and demonstration certified organic mixed cropping operation. After 3 years in conversion to organics the farm gained full BioGro organic certification in 2002.

### Intensive cropping history and weed issues

The farm had an intensive cropping history, with a considerable weed burden (Californian thistles, twitch and a range of annual weeds such as nightshade and fathen) and relatively poor soil structure. In fact, it was quite a test for organic production – if organic crops could be grown here, they could be grown anywhere. After taking over, the aim was to build soil structure and fertility. However, rather than sowing down the whole farm in pasture, which would have been the ideal way to rebuild the soil, crops were grown on some paddocks to provide income.

### Premiums up to 100% (above conventional)

In the first few years, there was little organic premium available for the farm in conversion, but after three years, BioGro certification was achieved, and premiums of 70% (for peas) and up to 100% (for carrots and onions) above conventional crop prices have made the farm more profitable.

A range of crops has been grown, with an emphasis on process crops in demand by HW such as peas, beans, carrots, potatoes and corn. Yields are often slightly less than conventional crops but organic premiums more than make up for this, and in many cases where crops have yielded well above average conventional yields the farm has been able to take advantage of the premiums available.

### Pasture and green manure crops

Pasture has been used in the rotation for two or three years to rebuild soil structure and fertility lost through cultivation and crop growth. Green manure crops (cover crops) are grown in between cash crops to provide a fertility boost. Crop residues, especially pea vine, are returned to the soil to add organic matter. The pasture phase also depletes the soil weed seed bank and provides an opportunity to top thistles.

### Process vegetables – less weeds

Process vegetable crops, such as peas, have been preferred over cereals and other longer maturing crops partly because they help to satisfy the demand for HW produce. They are also favoured because these are short term crops in which annual weeds are more easily controlled and any surviving annual weeds are unlikely to set seed prior to harvest of the crop. Peas have been grown frequently during the cropping rotation but Anthony White, Agronomist for HW, is now aiming for more pasture (i.e. 3 years in 6) to be grown on the property. The reason is to increase fertility to make the growing of other, more fertility-demanding crops more successful.

### Organic inputs

Inputs allowed under organic certification include Aglime and fine lime, reactive rock phosphate (RPR),

elemental sulphur, patentkali (a source of potassium), other non-soluble minerals and BioGro approved foliar fertilisers. Fish meal and meat and bone meal have been used with permission on nitrogen-hungry bean and corn crops but the emphasis is now on including legumes wherever possible in winter green manure crops to increase nitrogen levels in the soil prior to growing such crops.

**Reliance on cultivation**

Weed management on an organic arable farm is very different from on a conventional farm and relies primarily on cultivation. Ploughing is required for weed control, stale and false seedbeds are used to control weeds before germination or emergence and many crops are tined weeded and/or inter-row hoed several times after germination. Flame weeding is used prior to emergence in carrot and onion crops; however despite intensive mechanical weed control after emergence hand weeding is usually also required in these crops, which is extremely expensive. Crop choice in some paddocks is also made on the basis of what weeds are/are not present.

**Similar gross margins**

Financially Kowhai Farm is returning similar gross margins to conventional farms. Farm performance

has been constrained at times by a lack of capital (old machinery and irrigation equipment) and its small size which means it cannot benefit from economies of scale. In recent years demand for process crops rather than having a greater area in pasture (which would improve fertility and structure) has also been a constraint.

**Kowhai Farm – the future**

Heinz Wattie's recently handed over the day-to-day management of Kowhai Farm to local organic farmer Tim Chamberlain who will continue to produce a range of organic crops and livestock on the property. Tim's presence on the farm will enhance the research, monitoring, teaching and extension activities which will continue to be driven by Lincoln University and Heinz Wattie's and other interested parties.

*For further information contact: Anthony White, Heinz Wattie's Ltd, phone 03 349 1637 or 021 320 865.*



**Rotations** The six-year rotation of summer and winter crops at Kowhai Farm from the last season in conversion 2001-02 to 2006-07

Pdk	Area	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
		<b>Conversion</b>	<b>BioGro</b>	<b>BioGro</b>	<b>BioGro</b>	<b>BioGro</b>	<b>BioGro</b>
A1	4.8	Pasture Pasture	Pasture Pasture	Peas Lupins	Peas Barley	Onions Oats&Tares	Beans Pasture
A2	10.9	Beans Pasture	Pasture Pasture	Pasture Pasture	Corn/Fallow Barley	Carrot/Beans Oats & Tares	Peas Oats & Tares
A3	9.1	Peas Pasture	Pasture Pasture	Pasture Pasture	Onions/Peas Barley	Onion/Pea/Pot Kale/Oats	Onion/Pea/Pot Pasture/Cereal
A4	10.2	Ryecorn Lupins	Onions/Corn Fallow/Oats	Fallow Pasture	Pasture Pasture	Pasture Pasture	Pasture Pasture
A5	9.3	Wheat Clover	Sweet Corn Oats	Peas Pasture	Pasture Pasture	Pasture Pasture	Carrot/Beans Oats & Tares
A6	10.2	Pasture Pasture	Peas Lupins	Onions/Beans Oats	Onions/Corn Oats	Peas Oats	Peas Pasture
A10	2.4	← Permanent Pasture - Quarantine Paddock →					