A case study of conversion to organic field vegetable production Pollybell Farms

Project funded by DEFRA

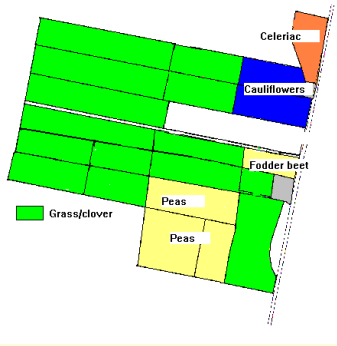
Conversion to organic field vegetable production Defra OF 0191

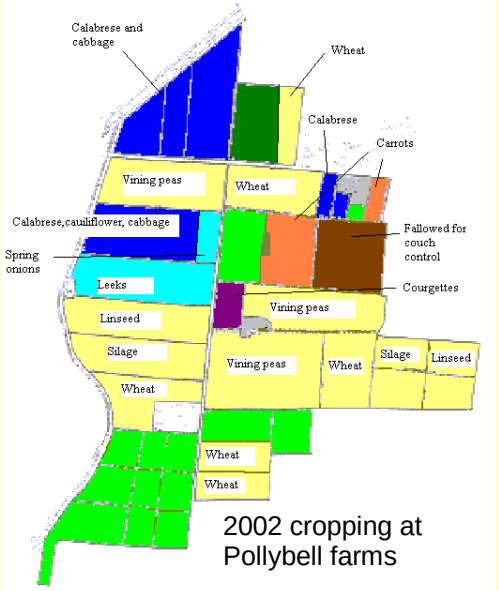
Project aims

- To monitor agronomic and economic performance during conversion at ten commercial farms, representing contrasting scenarios of organic vegetable production (this farm has been monitored for 6 years).
- To interpret and evaluate data and to produce appropriate information to aid farmers who are undergoing, or who are considering, conversion to organic systems, and to aid future policy making on related farming issues

Farm details

Location: Epworth, N. Lincs
Farm size: 1828ha (4517 ac)
Area converted: 661 ha (1633 ac)
138 ha (341 ac) in-conversion
Farm type: Arable, roots and vegetable farm converting with organic vegetables in rotation
Business : Limited company
Altitude: -0.3 to 3m (-1 to +10')
Rainfall: 733 mm (29")
Soil type: Light to medium, sandy loams, peaty in parts. Wind erosion problems
Prior land use: Wheat, sugar beet, potatoes, beetroot, cabbage, calabrese, carrots, celeriac, countryside stewardship and set-aside





2002 cropping at Pollybell farms

Farm physical characteristics

The farm consists of large flat fields well served by farm and council roads. Nearly all the farm is under-drained and has an excellent dyke system and its own sluices. It can therefore control its own water levels and thus drainage and irrigation. They have approximately 150 million gallons of irrigation licence. As the farm is low-lying, frosts can be a problem early and late in the season.

The soil types and exposed locations mean that about 80% of the farm is vulnerable to wind erosion and barley cover crops have been used for much of the conventional root acreage. Due to acidic sub-soils the farm is naturally pH5 and lime is applied which can lead to manganese and copper deficiencies.

Reasons and suitability for conversion

- Declining prices and returns from the conventional sector, demand from their customers for organic vegetables and government encouragement through increased conversion grants led the farm towards organic conversion in 1997. They converted in order to develop these new market opportunities.
- Organic conversion fitted in with the farm's strong interest in wildlife conservation, in that it would provide a greater amount of grassland on the farm.
- The farm was considered suitable for conversion due to its good soils, experience of vegetable production, high standards of management, good infrastructure and its eligibility to claim set-aside and the organic farming scheme conversion grants, thus minimising the loss of income during conversion.
- Inherent weed problems of the black peat fen soils were noted as a potential constraint.

Rotation

- Prior to conversion the farm rotation consisted of wheat, potatoes/vegetables, peas, sugar beet and set-aside. The set-aside provided the entry point for conversion to organic production.
- The fertility-building approach of this farm has been to use grass/clover leys, with the first block of land having 13 months of grass/clover and subsequent blocks of land between 20-22 months of fertility-building. With 33% of land area in grass in 2001 and 34% in 2002, considerable time and resources have been devoted to mowing the leys.
- Planned rotations: Two or three years grass/clover followed by three years of vegetables (less on the sandy land)
- Target rotations were not followed during the conversion phase due to the need for a variety of crops. The rotational strategy since then has been one of adapting cropping requirements in terms of market to land available.
- A dairy farm was also converted and fodder crops were included in the arable rotation. Occasional compromises between the need for silage for the cattle and fertility-building for vegetables.
- After two years of organic cropping the land first entered into conversion was returned to grass/clover, once a larger block of better land came out of conversion. The large amount of land on the farm allowed this flexibility in the rotation and for them to adapt to the needs of the market.
- Few over-winter green manures grown at start. Increasing use of vetch.

Soils and soil fertility

- Highly variable across fields. Deep permeable sandy and peaty soils affected by groundwater. Very complex soil pattern. Risk of winter flooding. Risk of wind erosion.
- Manure input from own organic dairy farm in exchange for fodder.
- No problems with availability of major nutrients. Crop performance good despite low P and K levels, no evidence of decline.
- Organic matter levels high. Ca high, pH low. Problems with Mn availability, derogation received to apply manganese sulphate.

Crop performance

- Pre-conversion growing experience stood them in good stead for organic vegetable production.
- Large volumes of organic vegetables have been successfully grown for supply to the multiple retailers.
- 15 vegetable types have been grown in the years since the farm converted, typically 10-12 different ones each year. Increasingly the farm has specialised in brassicas, bunching carrots, celeriac and leeks . Other crops such as potatoes and beetroot were less successful.
- Yields were highly variable relating to season influences and soil type. No clear trends related to time since conversion. Typically yields were 40-60% less than those grown conventionally.
- Some break crops, such as sugar and fodder beet, were abandoned due to the poor price paid and/or the high cost of growing them.

Weeds, pests and disease control

- Weed pressure on the farm could be considered medium to high, but with considerable variation across the farm. The first fields that became organic in 1999, largely black peaty soils, had the highest weed pressure, subsequent fields had soils with less weed problems.
- The farm grew a number of crops that posed challenges for weed control on peaty soils, such as carrots, and in particular the early carrots, beetroot and chicory, which were all drilled.
- The farm used a variety of approaches: stale seed beds were used, when possible; brush, finger and flame weeders were purchased and custom designed machinery for carrots was made. Large groups of gang labour have been hired. It has been a steep learning curve and their management strategies have evolved over time. Increased management input has been needed. It is notable that their costs of hand weeding have reduced over the four years of organic vegetable production, but are still high.
- High standard of weed control, low tolerance of weed levels in crops.
- Couch grass has been a problem in some fields with land taken out of cropping to bastard fallow. Dealt with effectively and not increasing.
- The large field sizes and cropping areas have posed challenges for pest and disease control.
- Due to increasing market specifications the farm has adopted increasing use of pest control inputs such as soft soap and Bt. This strategy has been successful with no major losses from pests or diseases.
- Though rejections from caterpillar presence have occurred, on an overall basis they have been controlled.

Management and labour issues

- Total overall, regular labour numbers (15.5 staff) have not changed through conversion, although there has been an increase of management staff and a small increase in office staff. This is due to the greater management time required for organic cropping.

- There has been a substantial (14 fold) increase in the amount of casual labour used on the farm, this is partly due to a change in the types of vegetables grown, many of which require hand harvest. It is also due to the need for hand labour for weeding. Casual labour is sourced through Harvest Opportunities Permits Scheme (HOPS) and gangmasters.
- The large rise in the numbers of casual labourers brought with it problems of how to pay these (piece rate or per hr for weeding), and in managing them.
- Some problems incurred from fairly rapid expansion of organic vegetable area (40% per year) e.g. keeping on top of the weeding.
- Three changes in management staff responsible for the organic vegetables in five years has caused some challenges.

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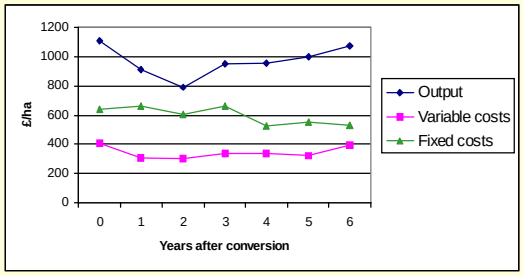
Marketing

Prior to conversion, vegetables were primarily sold to packers to be sold on to supermarkets. Some vegetables, such as beetroot and peas were also grown for processing. The contacts and relationships the farm had with these packers enabled them to sell similar lines organically, through the same channels. The farm was able to grow what the packers/supermarkets requested. As the organic market was becoming established and growing rapidly in the late 1990s and early 2000s, planning with the supermarkets was difficult as they were uncertain of sale levels. This led to over-programming and loss of sale of crops in some cases. During the years they have been growing organic vegetables they have seen the market change with increasingly high quality specifications and the lowering of prices, all which have impacted on the economics of production. The farm has tried to grow and sell crops such as sugar beet, potatoes and vining peas for processing, although this has been less successful. This has mainly been due to the low prices paid for the produce, which has not enabled them to be grown economically.

Farm output, variable and fixed costs during conversion

- Output fell during conversion.
- Variable costs stayed at a similar level, savings made in fertilisers and chemicals and rises in casual labour.
- Overall fixed costs stayed at a similar level.



Economics

- Conversion of half of the farm was achieved over a nine year period. This was done in three phases: 82 ha in 1997, 276 ha in spring 1999 and 303 ha in autumn 1999. Land was initially converted from existing set-aside land, then from conventional cereal land and last of all from a reduction in conventional vegetable and sugar beet land.
- The main costs of conversion have been due to the need to take land out of production and put it into grass clover fertility building leys prior to organic cropping. At the peak over 500 ha of land was in fertility building leys. The ability to claim set-aside on these leys has helped offset this cost.
- Additional investments of equipment specifically for organic production, such as weeders has been £84/ha. Other costs have been the time required to learn a new system of production, and crop failures.
- Yields of organic crops have been typically half those of crops grown conventionally on the farm. In most cases the higher prices received for the organic crops more than compensated for the yield reduction. However, higher costs of production, notably from hand weeding, have led this to being a higher cost and output system than conventional production, with associated higher risks from crop failure.
- Over the four years of organic vegetable production reduced prices and higher market specifications have led to declining economic returns per crop.
- Weeding costs have been the highest cost accounting for 40-50% of variable costs in the earlier years but this has fallen to 13% in 2002. This was partly due to an increased area of brassicas, which require less hand weeding, but also due to improved weeding strategies.
- The growing of organic vegetables has made a positive contribution to the profitability of the farm, before any rent charge.
- The overall farm economic performance has been affected by the poorer returns from the other non-vegetable crops in the rotation.

General conclusions

- The farm was considered suitable for conversion due to its good soils, experience of vegetable production, high standards of management, good infrastructure.
- From 1996-2003 nearly half of the farm has been converted in three main stages.
- During the in-conversion period land was taken out of production and put into fertility-building leys prior to organic cropping.
- Since conversion the area of organic vegetables has increased and large volumes of high quality, professionally grown organic vegetables have been successfully marketed through the multiple retailers.
- 15 types of vegetable have been grown in the years since the farm converted, typically 10-12 different ones each year. Increasingly the farm has specialised in the most successful crops.
- The rotational strategy has essentially been one of adapting cropping requirements in terms of the market to the land available.
- Soil fertility has been maintained through the use of grass clover leys and FYM applications.
- The farm has peaty soils which combined with drilled crops have caused challenges for weed control. It is notable that weed strategies have improved and costs decreased with increased experience. Couch grass has been controlled through bastard fallowing.
- The large field sizes and cropping areas have posed challenges for pest and disease control.
- Due to increasing market specifications the farm has adopted increasing use of permitted pest control inputs to minimise risk.
- The continued lowering of prices is eroding profitability. Growing organic vegetables, would not have been worthwhile without the conversion grants.
- The good contacts and relationships the farm had with the conventional packers enabled them to sell similar vegetable types organically, through these same channels.
- The loss of the organic dairy for economic reasons will have impact on future rotations.
- The overall farm economic performance has been affected by the poorer returns from the other non-vegetable crops in the rotation.

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Project information

This leaflet has been produced as part of the DEFRA funded project **Conversion to organic field vegetable production.**

The project aimed to help farmers and growers thinking of converting to organic field vegetable production to make informed decisions with the aid of the agronomic and economic information collected through a case study approach. The project is led by IOR-HDRA in collaboration with the OAS at IOR-EFRC, Warwick-HRI, and WIRS

www.organicveg.org.uk

Would you like to take part in our research?

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