A case study of conversion to organic field vegetable production *Chywoone Farm, Cornwall*

Project funded by DEFRA

Conversion to organic field vegetable production Defra OF 0191

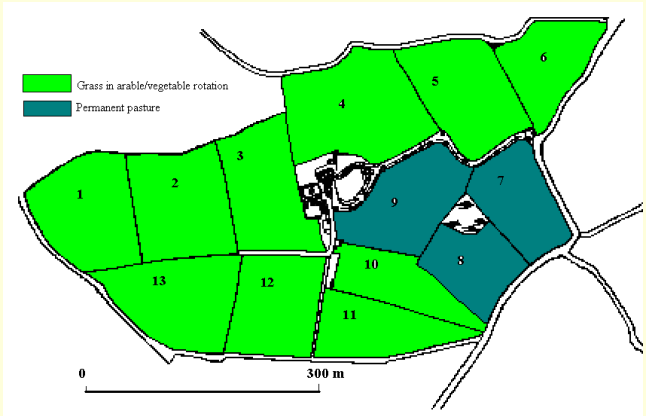
Draft version

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: Nr Penzance, Cornwall
Farm size: 70 ha (173 ac)
Area converted: 17 ha (42 ac)
Farm type: Mixed farm with livestock (dairy) and arable converting to mixed system with vegetables.
Business : Family farm (owner occupied)
Altitude: 91 m (300')
Rainfall: 912 mm (36")
Soil type: Well drained fine loamy, gritty loamy and fine silty soils over rock,with a humose surface horizon in places.



Prior land use: Pasture, early potatoes, brassicas, fodder crops
Conversion: Whole area converted over 2.5 years. Simultaneous conversion of beef suckler herd.

Farm description

This is a traditional family owned mixed farm in South West Cornwall. One quarter of the family farm at Chywoone was entered into organic conversion in 1999. The farm is located on a hill high above Newlyn harbour and as with most of the Lands End peninsula remains virtually frost free throughout the winter. It is therefore suitable for growing niche crops such as early potatoes, over-winter cauliflowers and other speciality crops. The well-drained loamy and silty soils are good for vegetable production. The farm is relatively level and comprises of small fields surrounded by Cornish hedges (stone banks topped by bushes). Three of the fields (7,8 and 9) lie wet and are permanent pasture and not considered part of the rotation.

The farmer has many years experience of growing conventional vegetables (brassicas and potatoes) and has carried on conventional production on his remaining land. The farmer was a member of UNIVEG, a packer specialising in brassicas which had a pack-house near Penzance.

Reasons and suitability for conversion

The mixed farming system is a relatively easy one to convert and that is one reason why, historically, more farms have converted in the South West of England and Wales than in the East where farms have become more specialised. As a member of UNIVEG, the farmer was persuaded to take up the challenge of meeting the growing supermarket demand. The farm has good soils, high standards of conventional management and a sustainable closed system. With a traditional rotation of three years grass ley, supporting a suckler herd, followed by early potatoes and winter cauliflowers, it was felt by the OAS that the system was ideally suited for conversion.

Farming system

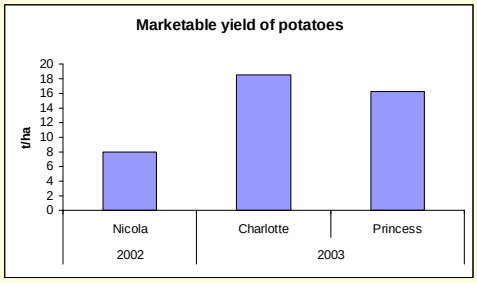
- Traditional grass based rotation. Three years grass/clover followed by early potatoes and winter cauliflowers or winter cauliflowers followed by potatoes. Re-seeding of grass leys in summer.
- Entering conversion meant the grass phase of the rotation was extended for a further 2 years than normal in two fields.
- Single suckler herd with cows over-wintered outside and young stock loose housed inside with supplementary feeding of silage and organic cereals. Horses also graze pasture.
- The cauliflowers are grown on a 28" x 24" spacing and planted in mid-July, under fleece. Fleece removed in September. Harvest November to April.
- Potatoes 34" rows with 6" between tubers, planted in March. Harvest end of June onwards.

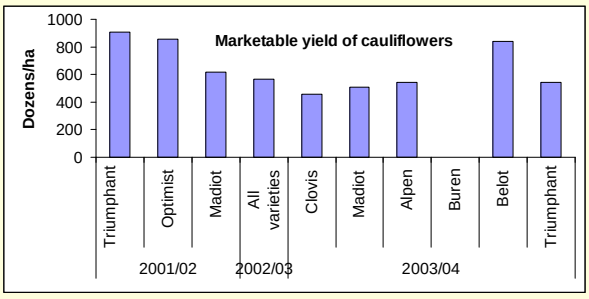
Soils and soil fertility

- Manure input from own suckler herd has provided fertility for crops
- Soil pH levels are naturally on the acid side and generally at 6.5 or below. Lime is applied in the rotation prior to the brassicas, to reduce club root risk.
- No problems with availability of major nutrients. Crop performance good despite low P and K levels.
- All fields low in Phosphorus. Rock phosphate applied. No significant changes in P levels.
- Some fields low in potassium. No trends established.
- Organic matter levels mostly OK. Stable or slight decline.

Crop performance

- Potatoes grown for set-skin punnets. In 2002 Nicola badly affected by blight, burning off the crop was delayed in order to allow the crop to bulk up more, which was in retrospect a mistake. In 2003 the varieties Princess and Charlotte were grown and both yielded well and were clean and uniform.
- Cauliflowers. In 2001/02 Triumphant and Optimist were grown in one field and established and grew so fast that no weeding was necessary. The Madiot were much patchier, mainly due to losses from cutworm and that enabled more weeds to establish (mostly charlock). The average yield for 2002/03 was lower than those achieved in the first production year but that hides a range of performances. The variety that performed best was Belot, Triumphant and Buren were reasonably good but Alpen was the poorest being affected by both frost and mouse damage. The Madiot also performed well. . There was a gap in production, however between the Buren and Madiot and managing continuity has been difficult with varieties maturing at different rates to those grown conventionally. The performance of the cauliflowers surpassed expectations and was often equal to his conventional crop. In 2003/04 there was a crop failure of Buren (weeds – see below) and the variety that performed best was again Belot. The Clovis suffered losses from cabbage root fly.





Weed management

- Creeping buttercup (*Ranunculus repens*) was the predominant weed in the grass leys during the conversion period. In April 2000, it covered 45% of the ground in one field (pictured). At the end of the rotation buttercups much reduced.
- Weeds controlled effectively in cauliflower and potato crops. Averaged less than 10% ground cover (2000-2002/03).
- Early potatoes can be difficult for weed control due to early flushes of weeds and possibilities of damaging chits when knocking down ridges. By planting later than for his conventional crop he achieved quick and effective control using a specialist weeder from Duchy college (s-tines and finger units plus re-ridging plates).
- Speed of establishment makes winter-cauliflowers relatively easy for weed control. Generally managed by inter-row cultivations and some hand-weeding. One crop had no mechanical or hand weeding but low levels of weeds. Where establishment was poorer e.g due to cutworm, weeds more of a problem.
- In 2003/04 season, one variety of cauliflower was rotavated in due to being over-run with black nightshade (*Solanum nigrum*).

Pests and diseases

- Pests and diseases of brassicas, in particular were the farmers biggest concern prior to conversion.
- Fleece used on cauliflowers immediately after planting - effective against cabbage root fly, aphids and larger pests. It is, however, one of the largest cost associated with growing the crop.
- Ring spot, downy mildew and Xanthomonas observed at low levels.

- The farm is in a high risk area for potato blight. In 2002 the choice of a blight susceptible variety (nicola) , slow sales and not topping/burning off haulms at the earliest opportunity led to large crop losses. In 2003 the use of different varieties (Charlotte and Princess), copper sprays and topping/burning prevented tuber blight.
- Problems with cutworm and wireworm have followed a longer grass ley phase than normal, as a consequence of conversion.

Management and labour issues

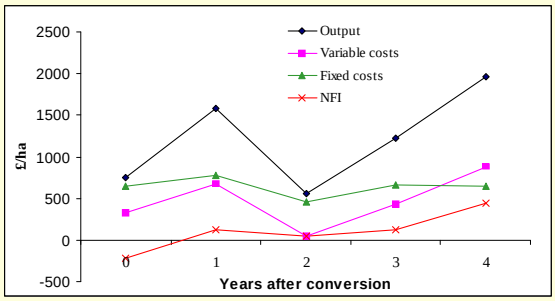
- Simplicity of system has meant few changes needed under organic management.
- Harvesting and equipment for early potatoes and cauliflower as for conventional crop which went to same pack house for grading/marketing.
- More labour was needed for fleecing and taking fleece on and off for mechanical weeding.
- Casual labour connected with vegetable production increased by 2.5 fold, following the commencement of organic vegetable production.

Marketing

- The farm has marketed all produce through a local packer (Univeg), as they were doing conventionally.
- In contrast to the expectations of a wide-open market for organic produce at the end of the nineties, the challenges have not been so much with technical issues but with marketing.
- The overall organic vegetable market is still quite small and therefore vulnerable to over-supply, especially at the supermarket level.
- Supermarkets also require similar quality specifications to that of the conventional market.
- Early potatoes have moved slower than anticipated due to strong competition from imports.
- The problem for cauliflowers has not been Class 1 produce, which have sold well through the supermarkets, but for Class 2 that will not sell unless nothing else is available.

Farm output, variable and fixed costs during conversion

- Output; initially rose as a larger area of conventional vegetables was grown. Rose to higher level following conversion.
- Variable and fixed costs: largely influenced by pattern of vegetable cropping.
- Net Farm Income (NFI): increased following full organic conversion.



Economics

- The farm is very reliant on vegetable production to generate its income. Under conventional production it produced 55% of the income, under organic production this was 70% . Low premiums available for organic beef has limited the suckler cow enterprise's profitability, as has the delayed registering of the herd as organic.
- Gross margins on early potatoes have been significantly higher than the farm was able to achieve conventionally, this is largely due to much better prices. Gross margins on cauliflower have been similar or lower than the farm obtained conventionally. Prices have often been double conventional ones but the yields have been more variable.
- The highest costs of production in cauliflowers have been fleece (30% of variable costs) for crop protection and casual labour (38%) for planting, weeding and harvesting.

defra
Department for Environment Food and Rural Affairs
Project funded by DEFRA

Conversion to organic field vegetable production Defra OF 0191

Draft version

HDRA
the organic organisation

General conclusions

- Conversion completed in single step.
- Farming system has not greatly changed after conversion;
  -Same crops grown.
  -Same marketing system.
- Existing equipment and infra structure has been suitable for both systems.
- Returns from this unit on the farm have increased under organic production.
- Costs of conversion - two years of vegetable and potato production were lost.
- Fears over weeds and pest and disease have not been as bad as perceived. Having said that potato blight has been a constant concern and poses a risk. Cost of fleece and handling of it have been high.
- Many of the challenges have not been so much with technical issues but with marketing.
- Conversion has been relatively easy on this farm type.
- Need to get livestock timing right. Problems were experienced on this farm managing the simultaneous conversion.

- Previous vegetable growing experience is invaluable.
- Advantage of keeping system simple i.e. no new crops.
- The organic farm is run as separate holding and business so there is no issue of parallel cropping on the conventional holding.
- The farmer has been pleased with the grass growth and silage yields from the pasture, however financially the livestock have not performed well.

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

HDRA the organic organisation
ELM FARM RESEARCH CENTRE
Warwick HRI
Prifysgol Cymru Aberystwyth The University of Wales

www.organicveg.org.uk

Would you like to take part in our research?
Contact
Phil Sumption or Anton Rosenfeld, HDRA, Coventry, CV8 3LG
Tel: 024 7630 8200
Fax: 024 7663 9229
E-mail psumption@hdra.org.uk or arosenfeld@hdra.org.uk

defra Department for Environment Food and Rural Affairs
Project funded by DEFRA

Conversion to organic field vegetable production Defra OF 0191

Draft version

HDRA the organic organisation