

Organic Arable Farming: Some information for farmers considering conversion to organic production

Organic requirements are in addition to other statutory requirements
Statutory information is for guidance only and is correct at time of going to print

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1 - Introduction

Organic arable farming is emerging as a major new opportunity for farmers due to the continued expansion of both the feed and food markets for organic cereals and pulses, provision of long-term security by Government funding and the current focus of EU agricultural policy on the environment.

OF&G considers that organic farming has a secure future but what are the real opportunities for organic arable cropping?

- Is it sufficiently profitable?
- Are livestock essential?
- Can weeds be controlled adequately in the long term?
- In the short term what are the opportunities for running a successful and profitable organic arable farming business?

This leaflet sets out to explain the options when converting a farm to organic, and highlights the opportunities and the challenges of meeting the current unprecedented demand for organic arable crops.

2 – Organic farming

Organic farming is a sustainable farming system that combines modern science and technology with traditional farming practices to maintain the long-term fertility of the soil and use less of the Earth's finite resources whilst producing high quality, nutritious food.

Organic techniques have been developed from an understanding of and research into soil science, crop breeding, animal husbandry and ecology. The maintenance of soil fertility relies principally on the use of legumes, crop rotations, the application of composted animal manures and ground rock minerals. Pests, diseases and weeds are normally controlled by choice of appropriate species and varieties, appropriate rotations, mechanical cultivation, protection of natural pest enemies, physical barriers and thermal processes.

Artificial fertilisers, pesticides, growth regulators and livestock feed additives are generally prohibited although some specified materials can be used in severely restricted circumstances.

3 - The Market

The buoyant UK market for organic cereals and pulses is driving new and profitable business opportunities for arable crops for both food (organic bread and breakfast cereals) and feeds for livestock reared to supply the

growing demand for organic milk, pork, eggs, and table birds. The tightening of the EU standards, which now requires 100 percent organic feed for cattle and sheep and for pigs and poultry by the end of 2011, is further increasing the demand and the growing awareness of food miles is reducing the appeal of imports.

There are strong wholesale markets in milling wheat (minimum 10.5% protein), feed cereals and pulses; notably wheat, barley, beans and peas. There is a particularly strong demand for quality proteins such as lupins and soya and a smaller but still significant demand for oats (for human consumption and animal feed) as well as some minor crops.

Of the mainstream field vegetable and root crops, there is a strong market for potatoes, carrots, brassicas and onions.

The UK has a well-developed marketing infrastructure with major grain traders, independent millers, national and international feed compounders, co-operatives and several national vegetable packers.

4 - Organic arable farming – how does it differ from conventional farming?

Most importantly, organic farming involves fixing nitrogen with legumes, encouraging soil life and wildlife, making best use of manures and compost, using resistant crop varieties, crop rotation, pasture management and mechanical weed control.

So although the field operations of an organic farm may look much the same as those of a conventional farm, inputs are very limited and these management practices take their place. This puts much greater emphasis on planning the farming system, particularly the rotation and it requires a very high standard of management. It also needs a rather different approach from the farmer, a willingness to work with a more complex system and less reliance on intensive inputs.

Organic arable farms generally have livestock, but not always. Grazing animals can provide a profitable way of utilising the grass-clover ley that forms such an essential component of most organic rotations.

5 -The types of farm suitable for conversion

Organic farming is possible in almost any situation, but some farms are much better suited to conversion than others, and the ease of conversion will affect the financial viability of a particular farm.

A history of good soil management is important, including good soil structure, maintenance of soil nutrients and good biological activity. This will have been encouraged by the use of manure and avoidance of the more damaging pesticides, such as nematicides.

Soil type will influence the type of crops that can be grown and whilst a very fertile soil is always a plus, organic arable farming can be as successful on Grade 3 chalk downland as on Grade 1 silts.

Free draining, easily worked soils are particularly straightforward to manage organically, because they provide so much more opportunity for mechanical weed control.

Weeds can of course be a problem in organic arable farming and a farm that has been kept reasonably weed free over the long term is much easier to convert. High levels of docks, creeping thistle, wild oats, charlock, couch and, on heavier soils, black grass, all make conversion more challenging and may require more costly cultivations for weed control in the long term.

A mixed farm with sheep and/or cattle has the advantage of existing infrastructure, expertise, a history of manure use and leys that will have benefited soil structure and weed levels. None-the-less there are many examples of all-arable farms that have successfully converted to all-arable or mixed arable/livestock organic systems.

Investment costs need careful consideration before committing to organic conversion. While the farm is likely to have more than adequate crop storage capacity, it may not have the necessary multiple storage bins

for a greater range of crops. It is also necessary to consider if the existing machinery is suited to shallow ploughing, accurate manure spreading, fallowing and mechanical weed control.

Farm size generally has little impact on the potential for conversion; large organic farms are quite practicable and there are many successful examples over 700 hectares. Of much greater significance is the expertise, standard of management and commitment by the farmer to making the system work. This requires attention to detail, a willingness to adopt new methods and a tolerance of a higher level of weeds in some situations. It is often linked to a motivation to produce high quality crops and enhance the farm's wildlife.

Location will determine available markets. Proximity to abattoirs, feed mills and major roads will play an important role in determining the organic enterprises undertaken.

6 - How to convert to organic

The conversion period is normally 2 years but this can be reduced to 20 months if records and a visual inspection show that there has been no use of artificial inputs for the 4 months prior to the date of application.

Conversion can be done in stages or the whole farm can be converted at the same time. Many farms, particularly mixed farms have successfully converted the whole farm from the start. The advantages of this are that the grant application forms only have to be completed once, there are none of the problems associated with managing organic and non-organic crops at the same time, there is no need to retain chemical weed control equipment as well as new mechanical weeding machinery.

Staged conversion over a period of perhaps three or four years has the advantage of providing time to learn new techniques, finding out which system suits the farm best and spreading risks by testing the market slowly. Another point is that, given the need for fertility building crops during conversion, it can be difficult to maintain cash cropping, avoid weed build up and keep cash flow steady during total conversion.

Therefore, it is probably more sensible for larger farms, (which would require major capital investment) and those without livestock to go through a staged conversion, converting perhaps twenty or thirty percent of land a year.

For farms converting as part of a new processing or marketing venture, it may be important to convert quickly, whilst others may want to maintain the option of selling into both the conventional and organic markets, so may continue to farm both systems indefinitely on separate areas.

7 - Crop Rotations

Organic crop rotations are governed by the need to supply the crops' nitrogen requirements from legumes and to keep control of weeds; so most rotations will include at least thirty percent and more usually fifty percent legumes in the form of clover leys, beans, peas and green manures. There must also be effective disease control and sufficient forage for any livestock as well as consideration of market requirements. A typical example of a rotation would be:

Year.

- 1 -2 Grass and red/white clover ley
- 3 Winter milling wheat, under-sown clover
- 4 Spring barley
- 5 Winter beans
- 6 Winter feed wheat, under-sown clover
- 7 Spring barley, under-sown ley

This rotation provides forage for livestock but it is possible to top and mulch the ley on stockless arable farms or indeed to replace the ley with one-year green manures such as vetch. Weed control will benefit from extending the 2-year ley into 3 or 4 years. Ultimately the rotation will be influenced by the particular circumstances of a farm, for example mustard might be useful for weed control and soil management.

More novel approaches to rotation design include mixed cropping i.e. growing two crops such as wheat and beans together. With careful variety selection, yields can be higher than for single crops. Mixed crops can be harvested separately or whole cropped if used for livestock forage.

8 - Livestock – are they necessary?

Livestock are not an essential component of organic farming but can help utilise temporary grass and clover leys within the rotation and return the nutrients to the soil via manure. However, in wet weather, their movements can cause poaching which can disrupt leys and spread weeds. Manure, particularly when fully composted, has a considerable beneficial influence on soil life and structure.

Organic beef finishing and sheep enterprises are particularly well suited to mixed organic farms, making good use of the forage. Stocking levels are typically 1.4 to 1.6 livestock units per hectare on good land.

Pigs and poultry can also fit well, although it is important that a system is established so that they can move rapidly around the whole farm, if they are to be properly integrated into fertility building and weed control. Soil type is important here, a light, free draining soil being essential for outdoor pig production.

9 - Weed control

Weed control remains the single greatest challenge to organic arable farming; weeds need to be kept under control in both the short and the long term. Rotation, crop and variety selection and use of machinery are all key. While triticale, rye and oats can be excellent weed competitive crops, wheat and barley are more susceptible, and unless there is good weed control, beans can quickly encourage high levels of dock, wild oat and creeping thistle infestation.

Mixed crops tend to be less susceptible to weeds because they require shorter periods with open seed beds. The Institute of Grassland Research (IGER) has done a lot of very useful work on aggressive grass swards to assist with weed control and the Henry Doubleday Research Association is an excellent source of information on non-chemical methods of weed control. (See Section 14 below for website and contact details.)

Weed control needs to focus on docks, wild oats and creeping thistle on heavy land, particularly where there is limited opportunity for spring crops or early mechanical weed control. On lighter land the focus is normally on charlock, poppies and couch.

Rotation and selection of the most competitive crops and varieties is essential. Use of row crops, particularly potatoes, can be invaluable for cleaning. Spring-tined weeders are widely and effectively used for annuals, weed strike pre-drilling is sometimes practical and the use of sophisticated automatic guidance inter-row hoes is becoming more commonplace. For perennial weeds however, fallowing is the most effective solution. This is time consuming, requires repeated weekly passes and needs precisely the right equipment to be effective.

Manure and straw are often sources of weed infestation so it is important to ensure that they have been thoroughly composted before use.

Whilst weeds can be a real threat, there are many farms which have been organically managed for twenty or thirty years which show that, with the right rotation, machinery and skill, organic arable farming can successfully keep control of weeds on a variety of soil types and deal effectively with a wide range of potentially serious weed problems.

10 - Soil management

Organic farming relies on clover leys and green manures for nitrogen, composted manures for recycling nutrients and making them available (NPK), and maximum availability of soil nutrients through crop rotation, good structure, worm and biological activity.

Legumes are essential and can fix up to 250 kg of nitrogen per hectare per year. Soil analysis is an important tool for organic farmers. It shows how the soil is changing from one year to the next and provides

guidance on the need for any mineral rock fertiliser such as Rock Phosphate, Lime and Kieserite, which may be used to rectify inherent nutrient deficiencies.

Manure applications are usually light (10 – 15tonnes/ha) and carefully timed to avoid leaching.

Organic farms may be allowed, under derogation and with restrictions, to use manure from extensive non-organic farms. This can be helpful during the conversion period, but should not be used long term.

11 - Pest and disease control

Pest and disease control in cereals and pulses is largely down to the rotation, avoiding the use of similar crops in succession and careful selection of varieties.

The greater natural resistance of organic crops, combined with diversity of cropping and increased predator populations encouraged by good natural habitat, does mean that pest and disease impact is minimal.

Low levels of aphids and chocolate spot, mildew and plant establishment problems may occur and although there is a limited range of natural pesticides permitted under derogation by the standards, in practice they are very rarely needed or used.

Pest and disease control in potatoes and field vegetables is another matter. These crops are particularly susceptible and packers' demands for cosmetic quality put real emphasis on disease free crops. The use of copper, sulphur, pyrethrin, and fleece covers is widespread, in addition to the permitted cultural techniques.

12 – The economics of organic arable farming

Many farms have run profitable organic arable farming businesses over the years by careful wholesale marketing and achieving premium prices.

The conversion period is often thought of as being costly and it can initially result in substantially lower crop outputs due to the need for fertility building leys or green manures (unless there are existing leys which can be ploughed for conversion cereals).

Capital investment in equipment, buildings and livestock may also be significant, depending on the individual circumstances. However grant aid for conversion and ongoing payments whilst organic are available, see table (2) below for details.

The profitability of the established organic business is usually as good as conventional and often better. The Farm Business Survey for Cropping farms (those with grains, roots and some livestock, including ruminants, pigs and poultry) showed similar Net Farm Incomes of around £190/ha in 2004, while in 2005 the organic increased to £209 and far outperformed the conventional when it was experiencing particularly low prices.

Mixed farms (with grains, beef and sheep) were slightly less profitable generally, but organic farms retained an advantage, particularly during 2005, with returns of £190/ha compared with a loss in the conventional. It is of particular interest that for both conventional and organic farms the fixed costs per hectare are very similar.

The profitability of organic farming is maintained by organic grants and organic premiums. In England there is an OELS Organic maintenance grant, which is £60/ha/year (in addition to the conversion grant).

Examples of market prices for organic crops versus their conventional equivalents are given in Table 1 below. These show that gross margins can be good, even with yields typically 60% of conventional.

Table 1 - Price comparisons – Conventional* vs Organic* (May 2010)

Item	Unit	Conventional (Ref. 1)	Organic (Ref. 2)
Feed wheat	£/tonne ex farm	100	180
Feed barley	£/tonne ex farm	80	155
Oats	£/tonne ex farm	75	135
Beans	£/tonne ex farm	140	230

Sources: (Ref.1) Saxon Agriculture (ref.2) Norton Organic grain *Prices correct at time of going to print.

Clearly farm profitability is very dependant on both grants and premiums. Grants are guaranteed and provide a secure form of income. Price premiums are potentially changeable and subject to consumer demand and market supply. Whilst there is always the possibility of prices dropping due to market pressure, imports or oversupply, the underlying strong shift in consumer purchasing towards locally produced organic food suggests there is a good business to be made from organic arable cropping.

OF&G is grateful to Mark Measures for giving us the benefit of his considerable experience in commercial organic arable farming, which has formed the basis of this Technical Leaflet.

13 - Sources of further information, grants, advice and references

Table 2 - Organic Grants:

England	Tel No: 08456 024 093
<p>Scheme Name and Comments Defra Organic Entry Level Stewardship (OELS) This must be applied for during the first year of conversion. (or no conversion grant for 1st, 2nd or, in the case of top fruit, the third year) Grants:</p> <ul style="list-style-type: none"> • £175/ha/year for first 2 years of conversion • Organic maintenance grant is £60/ha/year (paid in addition to the conversion grant) • applicants must generate 60 points per hectare - 30 from environmental management options as for ELS and 30 from possession of a valid certificate of registration. <p>Information on the Organic Farming Scheme can also be found at http:// www.naturalengland.org.uk/ourwork/farming/funding/es/oels/default.aspx</p>	

Wales	Tel No: 01970 622 100	
<p>Scheme Name and Comments Opening dates for applications are not yet known (at time of going to press). Information on the Welsh Organic Farming Scheme can also be found at http://www.organiccentrewales.org.uk/producer-supportpayments.php</p>		
Annual Payment Rates		
	Conversion rate	Organic rate
Initial Payment	£1,000	£500
Payment per hectare (1 to 300 hectares)		
Grassland	£150	£40
Horticultural crops	£150	£200
Arable crops	£150	£60
Top fruit and permanent crops	£200	£200
300+ hectares, extensive grassland and grazed woodland	£20	£10

Scotland	Tel No: 0131 556 8400
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Scheme Name and Comments

Opening dates for applications are not yet known (at time of going to press). Grant availability comes under the Scottish Rural Development Programme. Further information is available at:
<http://www.scotland.gov.uk/Topics/Rural/SRDP/RuralPriorities/Options/conandmainoforganicfarmin>

Organic conversion payment rates

A minimum payment of £500 per annum per IACS business for conversion applies.

Land Type	Year 1	Year 2	Year 3	Year 4	Year 5
Arable	£220	£220	£60	£60	£60
Improved Grassland	£105	£105	£50	£50	£50
Fruit and Vegetable	£300	£300	£60	£60	£60
Unimproved grassland/rough grazing	£5	£5	£5	£5	£5

Organic maintenance payment rates

A minimum payment of £500 per annum per IACS business for maintenance applies.

Land Type	Year 1	Year 2	Year 3	Year 4	Year 5
Arable	£60	£60	£60	£60	£60
Improved Grassland	£50	£50	£50	£50	£50
Fruit and Vegetable	£60	£60	£60	£60	£60
Unimproved grassland/rough grazing	£5	£5	£5	£5	£5

N Ireland	Tel No: 028 9442 6765 (Adrian Saunders)
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Scheme Name and Comments

Opening dates for applications to join the Northern Ireland Organic Farming Scheme are not yet known (at time of going to press). For further information contact your local Countryside Management Adviser or Adrian Saunders at DARD. The payment rates / ha (spread over 5 years) are: Horticulture and Top Fruit £670, Arable £570 and Improved and semi Improved Grassland £470.
http://www.ruralni.gov.uk/index/bussys/organic_production.htm

Table 3 – Advice on Organic Farming

Region	Tel.No	Scheme Name and Comments
England	0800 980 0048	The Organic Conversion Information Service (OCIS) information pack will provide information about sources of advice, farm walks and publications. For further information go to the following website www.naturalengland.org.uk/ourwork/farming/ocis
Wales	01970 622 248	The Organic Conversion Information Service (OCIS) (run by Organic Centre Wales) provides free organic farming information for farmers interested in conversion and for those who are already farming organically.
Scotland	01224 711 072	The Scottish Agricultural College (SAC) provides free advice by phone and organises farm walks and seminars. There are 23 SAC offices, throughout Scotland and all have staff trained to advise on organic agriculture.
N.Ireland	028 9442 6642 Manus McHenry	The C.A.F.R.E. Organic Advisory team provides free advice to new and established organic farmers.

OF&G Technical Leaflet 102 lists organisations that can provide advice and help to new and established organic farmers (available to download from the OF&G website or by post from the OF&G Office).

The Institute of Organic Training and Advice. Provides a database of accredited organic advisers.
 Tel: 01547 528546 Website: www.organicadvice.org.uk

14 - References

Organic Farm Management Handbook 7th Edition 2007. ISBN 1-872064-41-8 Provides a review of the organic market, farming costs, prices, certification, grants and sources of information. It offers the latest information to help organic and converting farmers budget, analyse their business and identify new organic opportunities. Available from Tel: 01970 622 248 or 01547 528546.

Organic Farm Incomes of England and Wales 2004/05 Jackson and Lampkin (2006) University of Wales Aberystwyth.

Organic Farming. Lampkin N. ISBN 0-85236-191-2 Farming Press, Ipswich IP1 4LG

Organic Cereals and Pulses Younie D., B.R. Taylor, J.P. Welsh and J.M. Wilkinson (2002) ISBN 0-948617-47-0 Chalcombe Publications, Lincoln

Websites

DEFRA Organic Farming Pages: www.defra.gov.uk/foodfarm/growing/organic/index.htm

Organic Centre Wales: www.organiccentrewales.org.uk

Scottish College of Agriculture: www.sac.ac.uk/consulting/services/i-r/organic/

DARD (Northern Ireland): www.dardni.gov.uk

Elm Farm Organic Research Centre: www.organicresearchcentre.com

EU Organic Farming Pages: http://ec.europa.eu/agriculture/organic/home_en

Organic Farmers and Growers: www.organicfarmers.org.uk

Weed control in organic agriculture from HDRA: www.gardenorganic.org.uk/organicweeds/index.php

The Institute of Biological, Environmental and Rural Sciences: www.aber.ac.uk/en/ibers/

How to contact us

For advice and further information call the OF&G certification office

T: 01939 291800 or local rate 0845 330 5122

F: 01939 291250 or local rate 0845 330 5123

E: info@organicfarmers.org.uk

W: www.organicfarmers.org.uk