

2. FIELD A: WESTERN SMALLHOLDING PROPOSAL

Introduction

It is proposed that an agricultural business, centred on a 1560 m² glasshouse, is to be established on part of Plot A.

Organic salads and season extended vegetables will be produced for local markets.

All power and heat for the Greenhouse and associated buildings will be provided from on-site renewable energy sources.

Low environmental impact or recycled materials will be used wherever possible in the construction of the Greenhouse and associated infrastructure. The Greenhouse, its self, has been reclaimed from another site where it was due to be demolished.

It is anticipated that the business will initially provide some part-time employment for local people in addition to the full time livelihood for the proprietor. In future years as the business becomes established and crop production intensifies a number of full time positions may arise.

What produced

A range of organically certified salads and season extended vegetables will be grown. Initially, for reasons of work load and the establishment of markets, production is likely to be limited to a small range of crops and focused on the local wholesale market.

The anticipated cropping plan is as follows:

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
1/5* cucumbers	1/5 cucumbers	1/5 cucumbers	1/5 cucumbers	1/5 cues
1/5 tomatoes	1/5 tomatoes	1/5 tomatoes	1/5 tomatoes	1/5 tomatoes
1/5 other**	3/5 other	2/5 other	2/5 other	2/5 other
2/5 fertility building	N/A	1/5 salad	1/5 salad	1/5 salad

* Proportion of Greenhouse given over to crop.

** 'Other' crops will be things such as sugar snap peas, french beans, early onions and leafy green vegetables.

In future years outdoor crops may be developed such as field vegetables, fruit orchards and/or fuel crops.

Method of Production

It is intended that salads and vegetables are produced in a 1560m² glass house.

The Greenhouse will be heated in the following way:

1. Wood fired heaters, manually lit, burning wood produced on site.

2. Use of a novel system of low power fans and underground pipes to store heat during the day for use at night.
3. Night time thermal screening automatically deployed at dusk.

These techniques will provide a semi heated environment for little ongoing expense and with no net CO₂ emissions.

In future, woodchip fired boilers may be installed, scheduled for 2016, to provide a higher level of heating so extending the season and yield of cold sensitive crops such as tomatoes.

The crops will be grown in fixed beds using an approach called 'no dig'. This is a gentler way of managing the soil and leads to improved soil structure, higher organic matter levels as well as a more stable and diverse soil flora and fauna. This leads to more efficient nutrient cycling with a consequent need for less input (manures and compost). The reduced loss of nutrients also benefits the wider environment by reducing nutrient pollution of water courses and ground water. The higher organic matter level also represents an increase in soil carbon ^{ref 1} so reducing atmospheric CO₂ and therefore helping to counter climate change.

Greenhouse ventilation will be by electrically powered vent windows.

Irrigation will mainly be by surface drip lines under automatic control. Rain water harvesting from the green house roof will provide the majority of the irrigation water. This will be stored in a 500 cubic metre reservoir, enough for 4 months without rain in the summer. The mains water supply will be retained as back-up and to provide potable water for vegetable washing, drinking etc.

Electricity for water pumping, operation of actuators, sensors, lighting, workshop tools and office equipment will all be provided by photovoltaic panels and a small wind generator. Electricity will be stored in batteries.

Cold storage for produce will be provided by use of an ex refrigerated lorry back. This will be cooled using a novel low energy technique with powered conventional refrigeration as back-up.

Initially soil fertility will be built up by importing compost and minerals, subject to the results of soil analyses, such as composted green waste from the Dimmer Landfill Site. Volumes of imported fertility building materials will decrease as the required level of soil fertility is achieved.

The need for imported manures will be minimised by using crop rotation including nitrogen fixing crops such as peas and green manures grown as an under storey to some crops. Some of the land outside the greenhouse may be used to produce compost material for use inside the greenhouse.

Time Scale

It is estimated that construction of the Greenhouse and associated buildings and infrastructure will take two years from the time of commencement. Work will be

carried out on a part-time basis with some paid help. During this time the land will enter a fertility building and general preparation phase which will result in fertile weed free soil in readiness for the growing of commercial crops. The land has been put into organic conversion so full organic status will be achieved in readiness for the first year of production.

If construction and soil preparation begins at the start of 2011 then it is anticipated that the first crops will be planted in early 2013 with the first produce by early that summer.

Financial Forecast

Capital Investment

The cost of buildings, infrastructure, labour and other costs prior to and during the two year construction phase are listed below.

Greenhouse dismantling, transport and storage *	£ 5000
Greenhouse erection	£ 7000
Greenhouse heat storage system	£ 1200
Greenhouse wood burners	£ 400
Thermal screening	£ 8000
Irrigation equipment	£ 1000
Water reservoir, materials and construction	£ 4200
PV solar panels*	£ 1250
Wind turbine and tower	£ 2500
Batteries and other power supply equipment	£ 3850
Delivery vehicle (van)	£ 1500
Compact tractor and implements*	£ 6700
Fertility building, compost	£ 2000
Fertility building, minerals and seeds *	£ 750
Fuel wood coppice plants* and mulch	£ 1140
Fencing (electric deer fence)	£ 400
Packing Shed, materials	£ 3000
Packing Shed, construction	£ 1000
Composting Area	£ 550
Track improvement and hard standing	£ 2000
Equipment general	£ 2000
Land maintenance (drainage, grass & hedge cutting)	£ 800
Organic certification	£ 600

Total **£57,840**

* Monies already spent.

Costsings do not include my own labour.

A large part of the investment capital will be from my own savings with top up from loans at favourable rates of interest.

Gross Output

Crops	2013	2014	2015	2016*	2017
Cucumbers	£ 5,000	£ 7,000	£ 7,000	£ 11,800	£11,800
Tomatoes	£ 3,650	£ 3,650	£ 3,650	£ 9,560	£10,360
Other	£ 4,200	£ 6,600	£ 8,000	£ 7,200	£ 8,400
Salad	£ 0	£ 0	£ 3,200	£ 6,750	£ 8,500
Totals	£ 12,850	£ 17,250	£ 21,650	£ 35,160	£39,060

*Higher production due to the use of higher levels of heat.

The above Gross Output figures assume wholesale prices at the expected levels of production for the crops in question. 'Expected levels of production' are based on my own records, figures published by Imperial Collage London ^{ref 3}, plus an allowance for time to develop markets, build soil fertility and overcome problems associated with scaling up. In future years some direct marketing may be developed with the potential to raise Gross Output further.

Expenditure

Variable Costs.

Year	2013	2014	2015	2016	2017
Seed	£500	£500	£500	£ 500	£ 500
Packaging	£470	£680	£750	£1180	£1,240
Seed Compost	£150	£150	£220	£ 290	£ 290
Manures	£300	£300	£150	£ 150	£ 150
Pest & Disease Materials	£ 75	£100	£100	£ 150	£ 150
Horticultural Sundries	£100	£100	£100	£ 100	£ 100
Electricity	£ 0	£ 0	£ 0	£ 0	£ 0
Greenhouse Fuel	£ 0	£ 0	£ 0	£ 0	£ 0
Water	£ 50	£ 50	£ 50	£ 50	£ 50
Delivery costs	£1070	£1070	£1070	£ 1070	£ 1070
Market costs	£ 0	£ 0	£880	£ 880	£ 880
Machinery Fuel etc.	£185	£235	£265	£ 295	£ 295
Total	£2,900	£3,185	£4,085	£4,665	£4,725

Fixed Costs

Year	2013	2014	2015	2016	2017
Vehicle Costs	£ 675	£ 675	£ 675	£ 675	£ 675
Vehicle Depreciation	£ 300	£ 300	£ 300	£ 300	£ 300
Machinery Costs	£ 200	£ 200	£ 200	£ 200	£ 200
Machinery Depreciation	£ 600	£ 600	£ 600	£ 600	£ 600
Glass Depreciation	£ 600	£ 600	£ 600	£ 600	£ 600
Infrastructure Dep.	£ 1,250	£ 1,250	£ 1,250	£ 1,750	£ 1,750
Liability Insurance	£ 500	£ 500	£ 500	£ 500	£ 500
Organic Certification	£ 550	£ 550	£ 550	£ 550	£ 550
Labour	£ 3,000	£ 3,500	£ 6,500	£ 10,000	£ 11,000
Total	£7,675	£ 8,175	£11,175	£15,175	£16,175

Profit/Loss

Year	2013	2014	2015	2016	2017
Variable Costs	£ 2,900	£ 3,185	£ 4,085	£ 4,665	£ 4,725
Fixed Costs	£ 7,675	£ 8,175	£ 11,175	£ 15,175	£ 16,175
Grower Income	£ 8,000	£ 10,000	£ 10,000	£ 11,500	£ 13,000
Total Costs	<u>£18,575</u>	<u>£21,360</u>	<u>£25,260</u>	<u>£31,340</u>	<u>£33,900</u>
Gross Income	£12,850	£17,250	£21,650	£35,160	£39,060
Profit/loss	£ -5,725	£ -4,110	£ -3,610	£ 3,820	£ 5,160

Demand

2009 was the bad year for organic products in the UK as sales were hit by the recession, according to the Soil Association ^{ref 2}. This marked a break from the long period of uninterrupted and rapid growth since the mid 1990's. At the start of 2010 rates of decline had reduced greatly with Tesco's and Waitrose reporting growth in their organic sales. Based on this and other indicators the Soil Association predicts a growth of between 2 and 5% in 2010. Both local direct outlets such as Farmers Markets and box schemes as well as local wholesale demand remain healthy.

My experience of growing and selling organic vegetables to the local market over the last ten years has proved to me that there is a good demand for local organic fruit and vegetables, particularly protected, i.e. glasshouse, crops. Prices that are obtainable for these, both retail and wholesale, are currently such as to make the proposed business a viable proposition. Possible local markets include Somerset Farmers Markets Direct, local shops, farm shops and restaurants particularly in and around Glastonbury, Farmers Markets and local veg box delivery scheme. Regional wholesalers include Better Food at Chew Magna and Sunseed Organics in Cullompton

Much of the organic fruit and vegetables sold in the UK are imported, particularly

from the EU. The recent decline of Sterling against the Euro has made imported goods from EU countries more expensive relative to home produced goods benefiting UK producers. The full effect of this change has yet to be seen but, if sustained, could lead to a renaissance for the UK fruit and vegetable producers, both conventional and organic.

The Government is committed to reducing green house gas emissions by 80% by 2050 ^{ref 3}. Organic farming has lower green house gas emissions than conventional farming. This is due to its non use of fossil fuel based fertilisers, its lower emissions of nitrous oxide and its low dependence on pesticides, which are often energy intensive in their manufacture. In addition the Soil Associations report 'Soil Carbon and Organic Farming' concludes that organic production sequesters carbon by increasing soil organic matter when compared to conventional agriculture and if adopted by all UK farms would offset 3.2 million tonnes of carbon each year. For these reasons it is likely that there will be greater government support for organic farming in future due to the growing recognition of these facts. As public awareness of the need to reduce green house gas emissions increases, and the part that 'buying organic' can play in this, it is likely that demand from consumers will increase.

The proposed project will be exceptionally low in its consumption of energy and other inputs when compared to other glasshouse operations whether organic or conventional. What little energy is consumed will all be from on-site renewable sources. As such the business will particularly stand to benefit from the government commitment to reduce emissions. This stands at 6% for the agricultural sector by 2020, ^{ref 3}.

The growing scarcity of oil and possible measures to reduce fossil fuel use by taxation are likely to increase the cost of energy in the future. This will increase the cost of imported goods due to the energy used in transport and will reduce the costs of organic producers as compared to conventional producers. This will particularly benefit ventures such as that proposed with its low energy use, non use of fossil fuels and local sales outlets.

Globally, demand for food is increasing due to generally increasing affluence and rising population. At the same time agricultural production is under increasing pressure due to soil degradation, increasingly erratic weather (because of climate change) and the pressure to reduce energy intensive inputs for cost and environmental reasons. All this points to increasing food costs and so will generally improve the financial position of agricultural businesses, including the proposed, due to higher farm gate prices.

Experience

I have been growing and selling organic fruit and vegetables for over 15 years. I currently have a small organic market garden which I have worked for the last ten years. The garden has two 54 feet long by 18 feet wide poly tunnels, an area of outdoor vegetables and fruit trees, mostly apples.

I sell through local outlets such as farmers markets, wholesale to Somerset Local Food Direct as well as to other growers. I have operated a small veg box scheme to the local village for the last two years.

I have a certificate in Organic Horticulture from Lackham Agricultural College in Wiltshire.

My background is in Science and Engineering and I worked for several years as an Electronics Engineer. I have a degree in Electronic Systems Engineering.

I feel that the above furnishes me with the skills and experience necessary to establish and operate a technically complex business of the type described.

Siting

See Layout Plan Western Holding.

The reasons why the site provided by the Plotgate Venture was chosen for the Greenhouse are:

- i) the site is on the outskirts of a village, close to other employment land;
- ii) the Greenhouse can be positioned with little or no visual impact to surrounding residents or on the local landscape;
- iii) it has road and track access which requires little improvement.
- iv) it provides a sufficient quantity of good quality ,flat agricultural land;
- v) it is close to local markets in and around Glastonbury;
- vi) it is well sited for local sources of soil fertility such as the Dimmer Landfill site;
- vii) there are no other similar enterprises in the local area;
- viii) the site has a mains water connection;
- ix) the practical and social support of other members of the Plotgate Venture.

Furthermore the position of the Greenhouse in the South West corner of Plot A was chosen because:

- i) the mature hedges provide an effective wind break to the South and East of the Greenhouse as well as visual screening (the hedges will be allowed to increase in height to about 15 feet);
- ii) the Greenhouse will receive good light all through the year;

- iii) it is located on the flatter part of the field so minimizing the earth works needed to level the site;
- iv) it is close to the track access in the SW corner of Plot A.

The Packing Shed is sited to the south of the Greenhouse close to the southern most edge of Plot A. Its proximity to the Greenhouse is to minimise the distance that consumables and produce, moving between the two, have to travel while far enough away as to not cast shade on the Greenhouse in the winter.

The Cold Store, Wood Shed and Composting Area are clustered around the packing shed for ergonomic and visual impact reasons.

An area of hard standing is provided just inside the entrance to the SW corner of Plot A to allow for vehicle turning and parking.

The site of the wind generator to the north of the Greenhouse provides a reasonably windy position whilst keeping to a minimum its visual impact and the electrical transmission distance.

The location of the dwelling to the west of the Greenhouse is for the following reasons:

- i) close proximity to the Greenhouse and other frequently visited functional units of the holding;
- ii) view of the entrance way into the South West corner of Plot A to monitor arrival of deliveries, visitors etc and for security reasons;
- iii) visually screened;
- iv) protected from westerly winds whilst having good light;
- v) space to develop a small garden area.

Need for a Horticultural Workers Dwelling

A dwelling is required on site for the following reasons:

- i) Long and sometimes unsociable hours with work often needing to start early in the morning and sometimes until late in the evening. The proximity of the dwelling to the Greenhouse will remove the need for frequent, time wasting commuting with the financial cost, energy consumption and traffic generation that this would entail.
- ii) Work will take place on site seven days a week as some vegetables need regular attention and/or harvesting.
- iii) It will often be necessary to check the correct operation of automatic systems at all hours of the day and night. Most of the systems will be designed and built by me and will often be experimental in nature. This increases the risk of breakdown or malfunction when compared to turn-key systems. Critical systems are irrigation, heating, electrical power and ventilation.

- iv) It will occasionally be necessary to light and tend wood fired heaters on frosty nights or, if temperatures are too low, for tender crops such as cucumbers.
- v) The dwelling will serve as an office so removing the need to duplicate comfortable heated space and allowing an integrated live/work situation with its attendant efficiency and social benefits.
- vi) The business will be environmentally cutting edge. Labour practices that minimise harm to the environment, use of recycled or low impact materials, and installing green infrastructure often cost more money and/or increase labour overheads when compared to conventional approaches. In order that the business is viable and able to compete with other operations that are not so environmentally constrained it will be necessary to keep costs to a minimum. An on-site dwelling will reduce the living costs of the resident so allowing them to draw a lower income from the business and hence reduce its costs.
- vii) Accommodation currently available in the village of Barton St. David or the surrounding villages, whether rented or bought, is not affordable to someone on agricultural wages. As such an on-site dwelling is required.
- viii) The Greenhouse was removed from the site of the old Lopenhead Nurseries, South Petherton. Several residences were built there for workers at the nursery presumably because it was judged that there was a need for employees to be constantly on site.
- ix) Although not normally considered a reason in its self for giving residential planning permission the issue of security is a real concern given the open nature of the site and the presence of much valuable and vulnerable property. It would be difficult, expensive and an eye sore to security fence the site or otherwise protect it from would be thieves and vandals. An on-site presence would help in this regard.

Conclusion

The Greenhouse business will have an exceptionally low environmental impact with it's:

- i) widespread use of recycled, reclaimed or second hand building materials;
- ii) use of low embodied energy building materials wherever possible;
- iii) new building wood to be to FSC approved or from other sustainable sources such as Tinkers Bubble in Somerset.

In operation there will be no net CO₂ emissions except those that are embodied in imported horticultural sundries, packaging etc. There will be minimal use of plastics, these often being reused multiple times or substituted with biodegradable materials

e.g. natural fibre plant support strings. Packaging will be returnable where practical. The project will contribute to the local economy and provide employment.

As such the project represents the latest in green thinking, addressing key local and national government development goals. It will provide data on alternative production methods and has a strong educational value.

The financial forecast suggests that the business will be viable due to its low operating costs and good demand for its premium produce.

The need for the full time presence of a horticultural worker has been shown and as such it is hoped that permission for a dwelling on site will be granted (See Appendix A. Agricultural Appraisal).

References

1. Soil Association report Soil Carbon and Organic Farming
2. Soil Association Organic Market Report 2009
3. Government White Paper 'Low Carbon Transition Plan 15th July 2009