

Reducing energy use and waste at Tolhurst Organic Produce

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The farm

Is a horticultural unit of 7 ha situated on grade 3c land on the edge of the Thames floodplain at the foot of the Chiltern Hills. It is a stockfree farm and grows over 70 different horticultural crops over 3 separate rotations. We have a well developed organic system having been in organic production for over 30 years. All produce from the farm is sold through its own box scheme supplying 400

customers in Oxford and Reading. We measure our yields in terms of the number of families we are able to feed; this is currently rated at 55/ha. This is feeding families at the rate of 75% of their vegetable requirements for the whole year. The figure includes the 30% of land that is in fertility building crops and beneficial predator habitats. We also measure direct energy usage for production and distribution using the same family format, this is currently 4.5 litres per family per year. This energy usage includes all energy used for tractors, mobile equipment, irrigation requirements and delivery vehicles. It does not include energy use for materials imported to the farm such as packaging, electricity, tunnel/crop covers, seeds, etc.



At Hardwick we have for many years been aiming towards an increasingly energy efficient system, and to that aim we have adopted a series of policies. These policies are designed to get to the heart of energy sustainability, rather than a 'bolt on extra'. The idea is that it becomes an integral part of the 'whole systems approach' of the farm.

Rotation

This is at the very heart of the systems approach. We operate a stockfree system as this makes optimum use of the inherent soil fertility without resorting to the importation of other farms' acres to supplement our fertility. Three separate rotations are in operation; field crops occupy a seven year rotation growing staple vegetable crops on 6 ha. Garden crops have a 9 year rotation and protected cropping is a five year rotation. Green manure cover crops are used extensively and the rotation is designed to allow for opportunities to undersow many crops as a means of reducing nutrient leaching and improve the availability of major and micro nutrients. Rotations are long to reduce pest and disease pressure and to allow for the maximum opportunity to develop fertility. This has a dramatic effect on reducing energy consumption in the transport, handling and application of bulky organic manures. It also allows other landowners to maintain their own fertility whilst reducing their own transport needs.

The health of the soil is central not just to the energy efficiency of the farm, but also to the health of crops and environment. Rotation is a very important tool to preserve soil health, particularly the earthworm and soil bacteria populations. A healthy soil structure ensures less energy usage in tillage and higher yield crops - better crops for less energy.

Marketing

We have developed a marketing system that is energy efficient. The box scheme only operates within a 25 mile radius of the farm, and within a tight geographical area. We have organised our customers into neighbourhood groups, led by a neighbourhood rep. Each neighbourhood rep is responsible for looking after around 15-18 customers. These customers will all live within a very short distance, often the same or adjacent streets; some are schools, universities or workplaces. We actively discourage customers from driving to their reps, and try as far as possible to encourage them to walk or cycle. Most of them maintain this ideal as they are close enough to be able to do so. We do not take on customers that are too far from the neighbourhood rep. So we are expecting our customers to join us and make a personal commitment to reduce food miles; they accept this in return for a reduced price organic product. The use of neighbourhood reps also brings an important social element linking food, the farm and people.

Packaging

Our marketing structure gives us the opportunity to develop excellent re-use facilities, as we are able through our neighbourhood reps to maintain close contact with the customer. They return more than 60% of all packaging used; and packaging will in many cases be used many times over. We do not use boxes as they are awkward for people to carry especially on bicycles, but use carrier bags instead. These are cheaper, use less energy to make and are easy for customers to store from week to week. There are different colour bags for different sizes; the Soil Association 'Eat Organic' bag is the one that gets re-used the most! We have now introduced paper carrier bags and are finding that customers are returning more of these compared to plastic bags, it seems that they respect and care more for paper.

We have reduced to a very low level the amount of additional wrapping that goes into individual vegetables within the main bags; in many cases we are able to use paper bags for this purpose. All paper and cardboard waste is recycled through a farm waste collection service, we have to sort and grade into bulk bags. We pay a membership fee and a nominal collection fee. This service has meant that we have had to install facilities to store the material undercover. A considerable amount of labour is involved with the sorting and storage of waste. The service also handles waste plastic; there is a relatively small amount of this as a result of replacing tunnel covers and some old packaging.

Composting

All organic waste is returned to the land via the compost heap. Most of the waste is crop residues from the tunnel production along with a small amount of bought in local barley straw. The straw is used initially to build field storage clamps for potatoes and other bulky crops; it is a useful addition to compostable green waste. Over the course of a year we produce around 30 cubic metres of compost, and this is applied to tunnel crops biannually, any excess goes onto the fertility building green manures in the garden crop areas. Production of compost is done within straw bale enclosures, turned at least twice and kept always under cover. I consider vegetable compost an essential component in feeding the soil, being particularly beneficial in improving soil fauna. The main problem with the operation is that most of the work is done by hand as the scale is too small to mechanise.

Soil analysis has shown that over the past 20 years available nutrients have improved in the field, this is particularly encouraging as there have been no inputs at all during that period. However I have now started to buy in green waste compost from the local composting site. This material is Soil Association approved and is of a very high quality, being collected from around our neighbourhood area. It is applied to the fertility building part of the field rotation, this being a 2 year ley of clover and Lucerne. It is applied at a

rate of 40-50 cubic metres per hectare just once in the seven year rotation.

Plant propagation

All the 130,000 plants used on the farm are produced either in our own propagation greenhouse or on our land. All field crops of brassica and alliums are grown as bare root transplants in the garden area and transplanted to the field. The buying in of propagation materials rely heavily on plastic trays, compost, transport, energy inputs in greenhouses and the plants tend to be more susceptible to pest and disease attack. By producing all our own plants we are able to reduce production costs and have much greater flexibility with planting times and the real benefit of healthier plants. Modular raised plants are kept to the minimum and this tends to be tender transplants for out of season cropping. We produce our own propagation media using green waste compost and a few basic inputs. This is both cost effective and has produced excellent result in most cases. Our policy of energy reduction does not allow for the direct heating of any growing structure, we do however use a very limited energy input to heat propagation benches and provide a little supplemental lighting for the earliest plants.

Crop storage

We have developed low energy systems for the storage of bulky vegetable crops such as potatoes, onions and squash. We have adjusted our cropping plans to ensure that we can produce a good range of crops throughout the winter and early spring without the need to use energy demanding storage systems. We are able to maintain fair quality potatoes by storage in straw bale clamps and similar techniques are used for some other root crops. Carrot and parsnip are stored in the ground where they are grown being protected by frost with earthing up. Onions are field ripened without the need to barn dry with heaters and they will store well until late spring.

To summarise we have developed a 'systems based' approach to energy conservation and have made it a part of the agricultural system that we operate. Through our direct local marketing structure we have been able to enlist the help of our customers in energy reduction and the recycling of materials.

If you would like a copy of 'Crisis What Crisis?', a brief study into how Tolhurst Organic Produce would operate with reduced use of fossil fuels. Production could continue but at a much reduced level using horse power and a higher labour input. This would have the effect of increasing costs by a factor of at least 3-4 times. Contact Iain Tolhurst at Tolhurst Organic Produce, Hardwick Estate, Pangbourne RG8 7RA, tolhurstorganic@yahoo.co.uk

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