

# Downland, Townland, Coastland: Mapping Worthing's Food Web

A Transition Town Worthing (TTW) Project  
(Local Food Group)



## Why are we mapping the food web?

The way we produce, distribute and retail food in the UK is dependent on cheap oil and creates a large proportion of the carbon emissions that contribute to climate change.<sup>1</sup> In West Sussex, food supply amounts to around 20% of the county's carbon footprint<sup>2</sup>. Sketching the network of people, businesses and social organisations that produce, process, buy and sell the food Worthing consumes helps us to understand why this is so and consider how it could change. We want to highlight the strengths and weaknesses of the current situation and identify opportunities to reduce carbon emissions and make our local 'food web' more resilient for the future.

We are a community group of volunteers so we are tackling the project in bite-size chunks. Eventually we hope to talk to fishermen, manufacturers, processors, retailers, hoteliers, restaurant owners, people in community food initiatives like community cafes, growing projects, cooking clubs and those working in education projects both within schools and life-long learning institutions as well as those involved with projects tackling waste. Our first section is about food producers - growers within the town itself and farmers from the 'feeder' area around. We welcome comments and feedback and at some point we will hold a food conference to present and explore the issues involved.

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<sup>1</sup>"Existing patterns of food production are not fit for a low-carbon, more resource-constrained future." Cabinet Office 2008.

UK Climate Projections 2009 estimate that by 2050 the South East will be 2-3°C warmer than now, with around 30% less summer rainfall, assuming medium emissions.

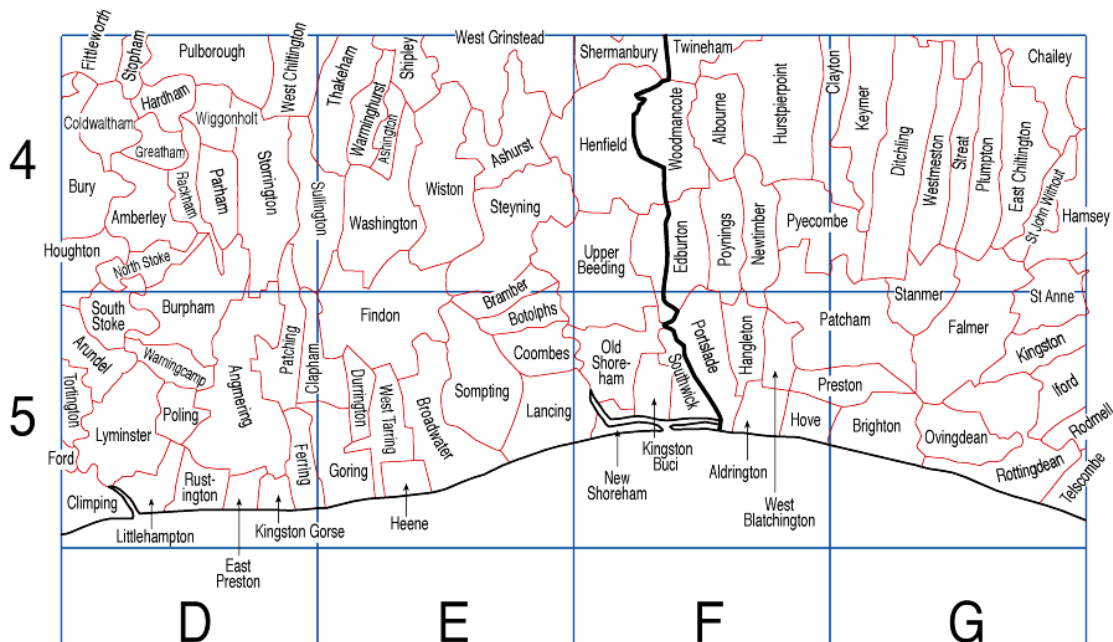
<sup>2</sup> West Sussex Energy & Climate Change Board, 2011, Using Less, Living Better.

## FOOD PRODUCTION IN AND AROUND WORTHING

### Worthing's food heritage

The old parishes that became Worthing (Broadwater, Tarring, Durrington) used to run north-south, linking downland, townland and coast land, each with their varied food resources. Each had access to downland pasture for grazing sheep, the rich horticultural land of the town where market gardens and glasshouses flourished and made Worthing famous for tomatoes, and the sea fishing that inspired the three-mackerel emblem on the town's coat of arms.

### Map of former Sussex Parishes



© SFHG 2002 cartography by Susan Rowland, University of Sussex (from Sussex Family History Group)

### How much land would Worthing need now to meet the basic food needs of its population?

Those parishes are gone now and Worthing's current population of about 100,000 would need around 22,727 hectares of combined agricultural and forestry land to feed its population<sup>3</sup>. Worthing's total land area, based on the current borough boundaries, is about 3,400 hectares, and of this only 980 hectares is gardens and 1,320 hectares is classified as green-space<sup>4</sup>, the rest being buildings, roads, etc.

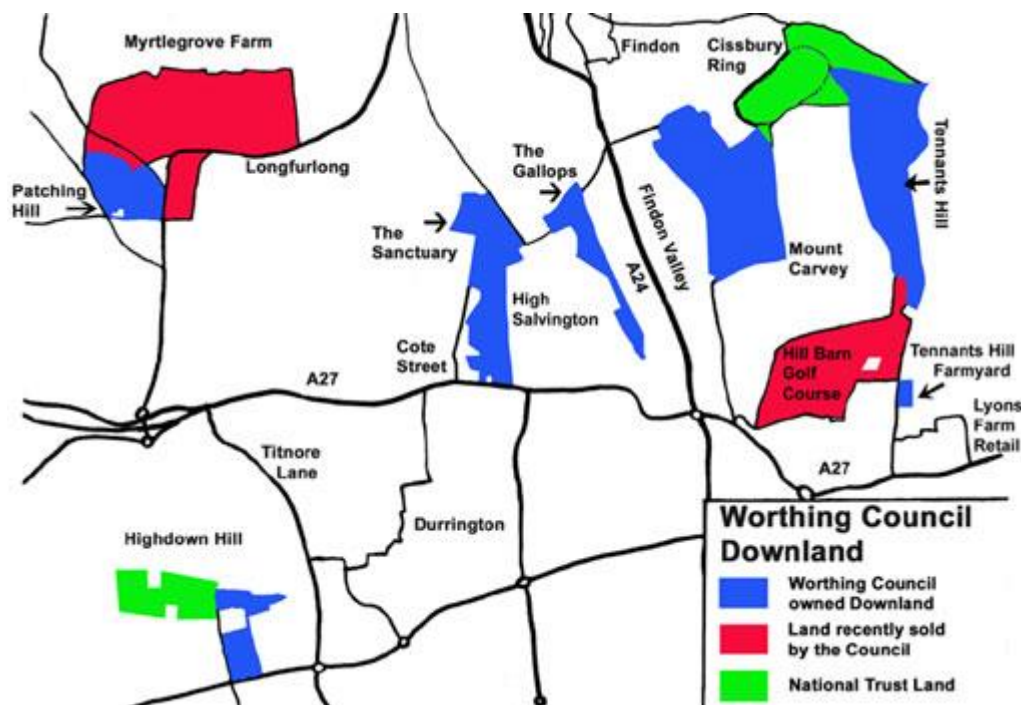
Worthing Borough Council (WBC) still owns some downland near to Worthing:

<sup>3</sup>According to Simon Fairlie's 'Livestock Permaculture' model of food production, 2007, 1 hectare of combined agricultural and forestry land is required to feed 4.4 people.

<sup>4</sup>DCLG 2005 figures

- About 76 hectares of former range-grazed downland at Mount Carvey and Tenants Hill, which WBC proposed to sell in 2010, but is re-considering as a result of public protest. This land is at high elevation and has thin rendzina type soil, so although it is unsuitable for crops, the old species-rich Down pastures could be regenerated, making it a hugely important site for locking up carbon in the soil, increasing diversity and extending the public's right to roam.
- The crown of Mount Carvey, and around the crown of Tenants Hill, at its north end, has a deeper clay-with-flints soil, and would be best used as reserve grazing for the National Trust's Cissbury Ring stock.
- Nearly 41 hectares of farmland and secondary woodland along the edge of the built-up area at Cote Street, west of High Salvington
- About 8 hectares between Patching Hill and the Longfurlong Road, north of Worthing
- A few hectares at the lowest contour of Cissbury Hill down against the edge of the built-up area at Findon Valley. The latter is currently in a full agricultural tenancy with the Langmead family (see later case study)<sup>5</sup>.

### Map of Worthing Borough Council-owned downland areas



Clearly, Worthing needs its surrounding county, at the very least, to supply its current food needs. Using the same food production model, West Sussex, with a population of 782,000 would require 177,727 hectares. The actual farmed area (including crop,

<sup>5</sup>Taken from Stop the Cissbury Sell Off website <http://www.scsco.co.uk/map.htm>  
See also Worthing Downlanders <http://www.worthingdownlanders.org.uk/index.htm>

fallow, pasture, grazing, woodland and set-aside land) is about 125,734 hectares<sup>6</sup> (and has been decreasing over many years). In terms of suitability for farming, Sussex as a whole contains some of the most and the least productive land in England.

However, a model produced for the south-west of England shows that 'food footprints', the land required to feed any given population centre, overlap<sup>7</sup>. So, the West Sussex food footprint may well overlap with that for East Sussex, Hampshire, Surrey etc and these may even be engulfed by London's food footprint. There is obviously an urgent need to stop the loss of farmland and to get more land into productive but sustainable use, as well as issues of what we eat and encouraging and skilling a new generation of food producers who are able to run profitable businesses. But as a start, we are looking at who is supplying us with local food at the moment.

### **Who grows food locally - and how resilient are they?**

There are just under 3,000 holdings in West Sussex of various types - cereal, general, horticultural, pigs, poultry, dairy, grazing livestock, mixed and other. But the current food production and distribution system means that local producers are often disconnected from local consumers. For example, Crumbs veg box scheme, who delivered from their base in Washington to Worthing, found that they had to source from as far as 50 miles away, including from East Sussex, Surrey and Kent.

#### ***Case study: Fletching Glasshouses***

Fletching Glasshouses have 2 acres under glass near Newick in East Sussex, 30 miles from Worthing. They are one of the suppliers of Crumbs veg box scheme and they also sell at Hassocks farmers' market and the Sussex Produce Shop in Steyning, West Sussex, but most of their produce is sold in East Sussex, through shops like Bills in Brighton and Lewes, farm shops at Park Farm (Falmer), Middle Farm (Firle Beacon), at farmers' markets, to some restaurants and to local veg box schemes. They are a certified organic nursery specialising in leaves (chard, mixed salad, mixed stir fry), which are ideally suited to the local soil type. They also grow beans, lettuce, beetroot, celery and some aubergines, tomatillos, etc.

The Raes own the nursery and there are 2 full-time workers, 2 part-time and another seasonal worker. Labour costs are the single most expensive input to the business. They compost green waste for use on site (80m<sup>3</sup>) but they still need to buy in 20m<sup>3</sup> of compost which they get from 2 suppliers in the Netherlands. They would like to source the compost locally, because of the transport costs on such a heavy item, but there is no local supplier certified by the Soil Association. They use and pay for a lot of mains water and have applied for a grant to build a huge water reservoir for harvesting rainwater. Seeds, sets and bulbs come from various suppliers in the Midlands, Isle of Wight and Colchester and this is because they are certified organic,

<sup>6</sup>DEFRA Agricultural and Horticultural Survey June 2007.

<sup>7</sup>Geofutures 2009 for Transition Town Totnes.

high quality and reliable germinators. (They don't save seed because of the high labour costs and because they often want F<sub>1</sub> varieties, which do not grow true from seed.)

The veg operation uses relatively little fossil fuels as the greenhouses are unheated. If fuel prices rise, their twice weekly deliveries would be the worst affected aspect of the business. In relation to climate change, Isobel Rae says that droughts and late frosts affect all growers, even under glass. The reservoir will reduce vulnerability to drought and they would like to install solar photo-voltaics for heating the glasshouses, but the costs are too high at present. However, Isobel considers that their greatest immediate business challenge is keeping prices down despite high labour costs and to develop niche markets, like their salad bags, so that they are not in competition with similar businesses. They have also diversified and have other businesses like Plants 4 Presents, an internet company selling trees, bushes and plants, some of which are edible fruit types and/or exotics, and Ladybird Plant Care which offers biological pest control.

Unfortunately, there does not seem to be any data readily available that shows how much of the food produced by West Sussex farmers is sold within West Sussex. But clearly farmers operate within a global market and whilst local supply chains exist, there is a huge pressure to get and keep a contract to supply the big supermarkets.

**Case study: Barnards Nursery**

**Barnards Nursery** at Washington, 7 miles from Worthing, is a 2 acre holding with a good deal under-glass, owned by Reginald Muntz. He works it part-time now and has some part-time labour, but it really requires 2 full-time workers. He uses mainly organic methods and the bio-dynamic planting calendar, but is not certified. He produces tomatoes, green beans, cucumbers, asparagus, courgettes as well as cut-flowers and plants, like chrysanthemums, sweet peas and cyclamen. He also has some apples and plum trees.

Reginald uses oil heating in the propagating house only, and buys in packaging locally from Fargro (Littlehampton) or from Kent, compost from Surrey, seed from Moles near Colchester and root-stocks from Siddlesham near Chichester. He saves his own French bean seed (locally renowned for its good quality). He sells locally in Washington, Storrington, Steyning, Brighton market and West Worthing at Kimptons. However, Reginald finds the cost of labour and low prices his major challenge. His trade has suffered over the years from competition from imports, such as Kenyan French beans which customers prefer because they come pre-packaged (and keep well). He used to produce strawberries on his greenhouse benches and got a good price from London buyers, but no more.

In terms of resilience, it is clear from many of the interviews we have done with local producers that supply chains, either in terms of what they need to buy in or where they sell their produce to, extend well beyond the boundaries of the county, for at least some key elements. However, Southview Farm Dairy is a good example of a

farm that is able to supply its needs, process on-site (adding value) and sell its produce locally.

**Case study: Southview Farm Dairy**

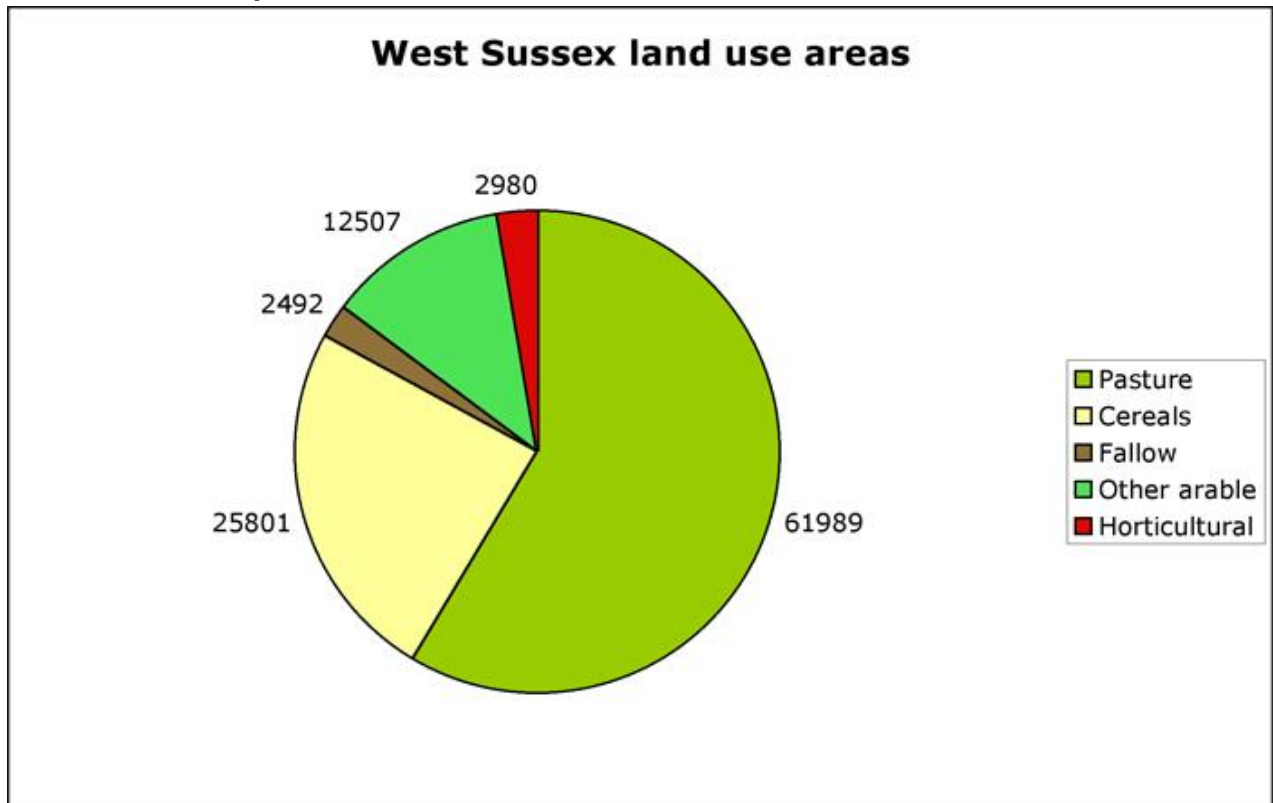
**Southview Farm Dairy** at Bury, 14 miles from Worthing, is owned by the Hughes family and they have a dairy herd of 130 milking cows and a beef herd of 100 young stock. They sell pasteurised and raw milk, cream and meat, only wholesale and retail at present. The farm is not organic although they use fertiliser sparingly and antibiotics only when necessary for the animal's health, rather than routinely. They brand their produce as traditional, local, farm-fresh. As well as the three partners, there are 2 farm workers and a driver. Five years ago they started processing and bottling the milk on site, which they now do three times per week.

They grow arable crops for fodder (grass and maize silage) but they still need to buy in feed, according to the nutrient level of their own in any given year. Most of the additional supply is obtained locally: corn feed from Houghton, 2 miles away, straw feed from Bignor, 2 miles away, and grain blends from a company whose headquarters is in Chichester, but which has mills all over the country. They also need to buy in bottles which are not manufactured locally in large enough quantities at a good price, so they buy them from a company in the north of England. Specialist washing solutions are also not available locally and they get labels from a company in Exeter because of the quality and price.

They are a truly local supplier, selling everything to village and farm shops, restaurants, cafes, village schools, nursing homes and caterers within a 15 mile radius. They have no outlet in Worthing yet, except through Crumbs food box deliveries. Their resilience was apparent in the big-freeze of 2009, when they were able to make all their local deliveries – good for customers and their business.

They have not yet started water harvesting because it would only be suitable for washing tractors - the cows drinking water and water for cleaning the processing equipment must be guaranteed free of contaminants. The cold spring in 2010 followed by a long dry spell stunted the growth of wheat and grass, producing only just enough for feed, and they had to buy in another third on top of the usual amount of other types of feed. Tania Reichert, one of the partners, with an awareness of environmental issues from her background in Germany, acknowledges that they could change what is grown if recent conditions are part of lasting climate change, but that it would take time to do so. They have looked into solar power but the costs of installing are too high at present. The greatest pressure on the business at present comes from low supermarket prices, rising costs, and bigger competitors in the south-east, which have caused many local dairy farmers to give up. The farm's greatest strength is their location, which gives them a solid customer base, and they plan to enhance this by building a proper farm shop so that they can sell direct to the public in future and possibly expand into other areas, like ice cream production.

## So what food is produced in West Sussex



Areas in hectares (ha) - data from DEFRA Agricultural & horticultural survey June 2007

### Pasture

Temporary grass 9,640 ha  
 Permanent Grass 49,560 ha  
 Rough grazing 2,789 ha

### Cereals

Wheat 17,124 ha  
 Winter Barley 1,350 ha  
 Spring Barley 3,422 ha  
 Oats 3,472 ha  
 Other 433 ha

### Other arable

Potatoes 535 ha  
 Sugar beet 59 ha  
 Field beans 1,432 ha  
 Peas dry harvest 994 ha  
 Oil seed rape 4,516 ha  
 Linseed 306 ha  
 Root, brassicas, fodder beet 104 ha  
 Other stock feed 395 ha  
 Maize 3,304 ha  
 Other arable 802 ha

### Horticultural

Peas & beans outdoors 60 ha  
 Veg & salad outdoors 2,098 ha  
 Under-cover veg 167 ha  
 Top fruit 318 ha  
 Small fruit 198 ha  
 Hardy nursery stock 124 ha  
 Bulbs, flowers 14 ha

In addition to the above, there is 10,746 ha of woodland, 5,709 of set-aside land and 3,570 'other' land that could potentially be harnessed for 'crop' production.

### **What would it take to feed Worthing?**

Following the lead of the Totnes Energy Descent Action Plan, we have taken each major food type and tried to estimate what it would take to meet Worthing's needs.

**Vegetables and fruit:** Between the 1860s and the 1950s, Worthing's high quality alluvial soil, climate and light were the basis for its successful glasshouse market gardening. Over a thousand tons of tomatoes, grapes, peaches, melons and strawberries were dispatched on dedicated fruit trains four times a week to London markets. It even supplied grapes to France. Figs were grown on some scale in West Tarring and small 'figpecker' birds like those in Italy were seen in the orchards. Most of this land was lost to housing in the mid-20th century. Other parts of Sussex were famous for cherries, plums, greengages and Leveller gooseberries.

It has recently been estimated by Riverford Farm, Devon, that 1 acre of land can yield sufficient organic vegetables for 30 veg boxes all year round. Looking at the West Sussex level, with about 320,915 households, about 4,330 hectares of horticultural land would be needed to feed West Sussex, but there are at present only about 2,841 hectares dedicated to fruit and veg.

#### **Case study: Langmeads\***

David Langmead started to diversify his 600 hectare wheat-based arable farm in 1986. Today his horticultural business occupies 2,600 hectares of land in the UK and he harvests 1.5 million iceberg lettuces, half a million Romaine lettuces and 100 tons of baby leaf spinach per week. The land stretches from Petworth to Oving, down to Chichester and then Selsey on the coast. For every mile towards the coast there is 10% more light and the temperature is 2 or 3 degrees higher at the coast. Production moves progressively south as the season progresses, taking advantage of the sandy soil further north which warms up more quickly in the spring and finishing on the moisture retentive southern clay. When the growing season here finishes, salad production moves to identical operations in Italy or southern Spain.

The farm's turnover is 20% organic produce, depending on crop rotation and green waste from the farm's own crop waste and from the wider community.

They employ 128 full-time staff and 460 seasonal workers, mostly East European, but as labour prices rise, they have tried to cut the wage bill by increasing mechanisation. The crop is cut, bagged, sealed, boxed, labelled and bar-coded all in the field where it grows. His Chichester operation uses 90 tractors.

\*Taken from Good Food & Drink in Sussex, Fizz Carr, 2008



With problems around how more farmland could be made available for horticultural use and whether existing suppliers would be resilient without cheap oil, another way of supplying Worthing's fruit and veg needs could be to look to the townland again. There are approximately 44,128 households, which would require 595 ha to keep them in fresh vegetables. This is encouraging since there are 980 ha of gardens in Worthing and although these are not all going to have ideal growing conditions or be cultivated by skilled vegetable growers, there is more than a reasonable chance that the town could feed itself in this respect if it had to. In World War Two, the nation was able to achieve yields of 40 tons per hectare from allotment and back garden vegetable production. So, another way of looking at yield and demand is to say that if the daily requirement of fruit and veg is about 500g/person/day, Worthing would need around 18,250 tons. If it could achieve war-time productivity, it could produce this from only 456 hectares of the available gardens. Of course, demand for other types of food like cereals and meat, would be much harder to satisfy locally or even at country level.

*Conclusion: We need more urban fruit and veg production but also a change in habits and expectations so we eat with respect for seasonality. This is one of the key reasons why TTWs Local Food Group has committed to an annual programme of 'Sow and Grow' activities, including the spring Seed Swap, and to Garden Share, a scheme that matches garden owners who have under-used land with people who want to grow vegetables but have no garden or allotment.*

**Cereals:** In 2007, cereals, mostly wheat, were grown on 25,801 hectares of land in West Sussex. If 4.4 tonnes of cereal are produced per ha, this would be 110,944 tons. Based on an estimated requirement of 448g per person per day, this could feed 678,475 of West Sussex's 782,00 population or 86%, although much of the wheat crop is used for animal feed and for bedding straw rather than for human food production.

A representative of the National Farmers Union (NFU) estimated that, in a good year, more than one third of wheat grown on the Downs is high quality varieties for milling because of the good, free draining soils in the county. Farmers on good land will choose to sow certain varieties in the autumn to produce a quality crop. Quality is often dictated by weather conditions during the growing season and at harvest (e.g. dry weather is better than wet, as wet can mean problems with fungus etc). The best milling wheat is used for bread, the less good quality will be for biscuits and pastries.

The NFU does not know who is the largest cereal producer in West Sussex, but some of the larger estates are likely to be among them. These include the Wiston estate near Steyning, the Norfolk Estate at Arundel, Goodwood near Chichester, Leconfield Farms near Petworth and Karova Farms Ltd at West Dean.

**Case study: Church Farm, Coombes**

The Passmore's have been farming Coombes on the South Downs, near Lancing, for five generations. They started as tenants of the Petworth Estate in 1901, taking on the land, which had not been farmed for two years due to the great agricultural depression, almost rent free for the first year in order to afford the vast amount of fencing required. The farm was then bought from the estate in 1924 and has been handed down through the family ever since. As well as the downland, 140 acres of rich alluvial soil down by the River Adur, 2 metres below high tide, was drained for crop growing.

During the war, a large area of the Southdowns was taken over by the army for training, including all of the Passmore's land. When it was returned in 1946, it was covered in spent shells and live ones which had to be cleared and the land quickly brought back into food production to help ease the rationing. At that time they milked 60 cows and grew 30 acres of potatoes (which were harvested by land girls and Prisoners of War). They also grew 250 acres of wheat and barley, which was cut with a binder and moved with a horse and cart. At that time they had a staff of 16. There had always been a sheep flock, originally of 200 Southdowns, which were looked after by a full-time shepherd and his dogs, who would move the sheep on a daily basis in order to maintain the fertility of the downs. Until 1930, the land was rotated between kale, rape, swedes or tares which the sheep grazed and wheat or barley which benefited from the extra fertility the sheep added. From then on they started using artificial fertilisers, with only a few winter fodder crops grown and the sheep graze mainly on the pastures.

In 1958, the dairy herd was sold and the beef enterprise set up. Additional pieces of land were bought and by the 1980's they grew 650 acres of wheat and barley, producing in excess of 1500 tons of grain and in one case getting 4 tons per acre or 10 tons per hectare, so joining the elite 10 tonne club. They also produced 450 fat cattle and 1200 fat lambs. The farm became very intensive, with aeroplanes used to fertilise the steep banks. However, they also planted large areas of trees and shrubs for conservation and as a result won several awards. With help from the Women's Institute, a bank of flowers was planted and now has over 200 different species including cowslips, orchids, poppies, 'eggs & bacon', bedstraws, clovers, scabious. In 1990, Passies Pond was dug. At this time they employed 8 full time staff with a further 16 casuals in the peak times.

Church Farm now comprises 1000 acres or 420 hectares. As well as beef and lamb, they grow hard wheats for breadmaking, soft wheats for cakes, biscuits and animal feed, barley for beer and animal feed, lucerne (Alfalfa) for hay and rape for sheep feed in the winter. They also own Applesham Farm. The Passmore's have been adept at changing with the times. As well as the mixed farm enterprise at Church Farm, which only employs two full-time staff and one casual, the rest being done by contractors, they have diversified into providing farm and lambing tours, course fishing, a caravan site, a model aeroplane club, as well as hosting arts and music events for the community. However, their own website acknowledges that Government grants are the main reason they are able to continue, and they suspect that only housing developers would want to take on the land if they ever sold up due to the difficulties of making a living from it.

*Conclusion: We should continue to make the most of our local cereal growing, whilst using more of it locally to supply local bakers and bread makers. It would seem that the most important change would be to move away from grain feeding animals as well as developing alternative sources of flour, say from nut trees, which could be incorporated into mixed farms and even urban settings. One TTW member has already experimented with grinding acorn flour to produce delicious shortbread.*

**Meat:** 19th century farmers aimed for maximum production of both sheep and wheat and the two forms of farming were entirely interlinked, unlike the sheep and arable farming of today<sup>8</sup>. The influx of cheap wheat from the USA in the later years of the century led to a decline in both arable and sheep farming and the disastrous miniaturisation of the breed resulted in the native Southdown sheep becoming a rare breed. Its fortunes are improving again now. The Sussex local breed of cattle adapted to the High Weald (and a good working animal as well as for beef) never had much of a hold in fertile, mild, West Sussex, where the Devon dairy breeds were favoured, but there are a number of local farms rearing Sussex cattle. About an equal number of holdings in West Sussex rear sheep (522) and cattle (503, including beef and dairy), whilst 455 rear poultry, 110 goats and 75 pigs.

The South East Food Group Partnership says that farmers in the South East can supply us with two thirds of the meat we consume. However, it is likely that in the future we will need to move towards lower meat consumption to live within our 'food shed', away from grain-fed cattle and towards more chicken and pigs as part of integrated, mixed farming systems. Large areas of Sussex are unsuitable for pig farming due to the heavy clay land (and there is no native breed), but small-scale production flourishes. Goodwood keep saddleback sows, formerly in the estate woodland, but now rotated around the fields. There are two local abattoirs, which are important for producers. The area north of Petworth was 'famous for fowls' in 1801. Now a small number of farmers raise high-quality birds, factory farming being mostly concentrated in grain-rich areas of the country. Sussex's big estates are also prime game bird territory and wild rabbits have flourished in recent years and have to be controlled to preserve valuable pasture.

We could also acquire much of the protein we require from nut crops. e.g. hybrid walnut and sweet chestnut can produce 1 ton per acre after 15 years, about the same as wheat production. 1 ton walnuts also yields about 60% of its weight in edible oil (Crawford 1996). This agro-forestry approach has the advantage that it can be worked in around current farming practice over a period of time.

*Conclusion: On the whole, we need to adapt our diet to eat less meat, but grazing animals is also key to the management of our local downland (which is unsuitable for*

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<sup>8</sup>Good Food & Drink in Sussex, Fizz Carr, 2008.

*many other agricultural uses) and pasturing can be one of the most efficient ways of locking up carbon in the soil. Many types of livestock can be integrated into holistic farm management, but we could also develop the growing of nut crops for protein as part of diversified farms. As consumers we can support local producers by buying a variety of meats direct from the farm, farmers markets, buying schemes and local butchers who can verify that the animals have been reared compassionately. We can also celebrate this aspect of living heritage at the annual Findon Sheep Fair the second Saturday in September.*

**Case study: Goodwood Estate**

The 1,200 hectare **Goodwood Estate**, north of Chichester, is the largest lowland organic farm in the UK, the first 100% organically-fed dairy in the country and is almost entirely self-sufficient. Nestling at the base of the Sussex Downs, the soil is mainly free draining chalk, which is ideal for spring, malting barley and for the grazing of sheep and beef. The soil on the coastal plain is silty gravel and is best suited to grassland, which is grazed by the dairy herd. Red and white clovers and lupins are sown to provide forage and grazing whilst fixing atmospheric nitrogen. The arable acreage provides the animals with organically grown fodder for the winter months - wheat, barley, oats, beans, vetches. Crops are grown in rotation, to help prevent disease and maximise the soil's natural nutrients. Farmyard manures, slurry and the pigs add nitrogen and organic matter to further encourage the best possible organic crop yields.

The downland is in Environmental Stewardship Agreement (ESA), looked after in the traditional way to maintain and encourage the growth of indigenous species of grasses, flowers and herbs thus keeping the habitat to enable chalkland wildlife to thrive.

Half of the milk produced by the 200, mostly Shorthorn, dairy cows is processed and bottled on site and 60% of its entire production is used by its own ready made market - the race track, motor circuit, hotel, restaurants and events of the Estate, but it also supplies its own farm shop and local shops in the area and has a contract with a milk wholesale company. The milk sold in bottles is non-homogenised (the fat particles are left alone and are not suspended in the milk) which is widely understood to be better for health. Raw, unpasteurised milk is also available but only from the farm's own shop, situated at Home Farm. Some of the milk is processed on site to make a range of traditional hand-made cheeses and butter, under the guidance of an expert with three generations of experience. Malting barley is used by a local artisan brewer, Hepworth & Co of Horsham, to produce Goodwood's organic lager and ale.

Beef from the traditional Sussex breed is used by Goodwood's own hotel, restaurants and cafés and Home Farm's wholesale department also sells to local restaurants. As well as traditional cuts of meat, Goodwood makes 50,000 burgers and 10,000 sausages annually which are sold during their events and at other prestigious national sporting events.

### **Dairy:**

If the daily per capita demand for milk and dairy products is 568g per person, it requires 2,825,000 hectares of arable land and 1,765,000 hectares of permanent pasture to provide for a national population of 60.6 million people. Scaling down for West Sussex, it would require about 162,000 tons of milk from 36,725 hectares of arable land and 22,945 of pasture. West Sussex does in fact have 49,560 hectares of permanent pasture, but the 38,308 hectares of arable land available includes 25,801 hectares of cereals, which is already insufficient for human nutritional needs in the area.

Dairy farming in Sussex has always been small-scale due to a drier climate than in the south-west but it enjoyed a brief age of profitability post-war. The low milk price since 1984 has led to a sharp decline and local dairy processing is rare, unable to compete with cheap supermarket supplies. Those dairy farms who have survived tend to be relatively large scale, able to add value by processing on site to produce niche products, and/or have created their own closed-loop, diversified enterprises.

There is also significant production of raw milk in East Sussex - Middle Farm at Firle, Gote Farm at Ringmer, Langleys near Hailsham and Plaw Hatch near Forest Row. Langleys deliver about 1000 bottles of milk per week in the vicinity of their farm, a tenth of their production but 25% of their income.

#### **Case study: High Weald Dairy**

**High Weald Dairy** near Horsted Keynes, 25 miles from Worthing, is a certified organic dairy specialising in cheese production. Sarah and Mark Hardy have a 250 dairy cattle herd and they produce a 100 tons of cheese per year in the cheese yard 25 yards from the field. They process their own organic cows milk (making 60% of their cheese) and buy in conventional and organic sheep milk and conventional goat milk (making 40% of their cheese) from Dorset, Stratford on Avon and south-east England. They have to buy in because they don't have enough of their own land to produce what they need. They grow a lot of their own fodder crops and 90% of the cattle feed that is bought in (silage, grain, rape seed) is from local farms.

The cheese they make includes halloumi, Duddleswell, Sussex Slipcote and Tremains Organic Cheddar. They sell to around 150 shops and box schemes in Sussex, Surrey, Kent and London and this accounts for about 50% of their sales. About 10-15% is sold to wholesalers and 15% to supermarkets locally and the other 20% to the rest of the UK (as far afield as Halifax). They also sell organic milk from the Goodwood Estate and bio-dynamic yoghurt from Plaw Hatch Farm, East Sussex and from Court Lodge.

Although Mark acknowledges the price advantage that organic farmers have from not using oil-based chemicals and fertilisers, rising fuel prices would affect production costs because organic farmers tend to make more cultivations by tractor, rather than using pesticides.

Mark estimates that the dairy could expand its production by a further 50%. They also have a sister website company selling special occasion cheese 'cakes'.

*Conclusion: Low milk price is the main reason why small dairy farmers have gone out of business. It is important to support the few local producers that remain, especially as dairy processing of milk into skimmed and non-skimmed milk, cream, butter and yoghurt creates local jobs and supports the local economy. Dairy farms also have potential to produce some beef. The more farmers can move towards grass-fed rather than grain fed cattle within a holistically managed farming system, the less need to grow or buy in fodder crops.*

### **Alcohol & fruit juice:**

The traditional Sussex drink was beer and Sussex used to be the second most important hop producing county after Kent. There are currently around 20 breweries, ranging from cask ale manufacturers like Harveys near Lewes, which has an estate of more than 40 tied houses, to much smaller bottled beer micro-breweries. The National Collection of Cider and Perry is housed at Middle Farm, Firle, which also produces its own cider. One local cider maker has no orchards of his own but forages from the wild, common land, abandoned orchards and increasingly from roadsides and dual carriageways. With increasing summer temperatures and the advantage of suitable soil type, there are a number of vineyards in West Sussex at the forefront of the English wine production revolution, like Wiston, Nyetimber, Nutbourne and Highdown. We do not yet have data on how many bottles of wine or pints of beer are produced locally or estimates of how much capacity could be increased.

In terms of fruit growing, the terrain is not suitable for many sorts of large scale fruit farming and much of the land in and around Worthing that was ideally suited in terms of light, soil and climate has been lost to housing. The impact of supermarkets and consumer demand for 'perfect' specimens has also led to many traditional orchards being abandoned. Grange Farm, Funtington, near Chichester is one of the last remaining and Roundstone Farm, near Worthing has a thriving 'pick-your-own' business. Climate change is also affecting what varieties can be grown and growers need to be flexible, but the resulting fruit is often bigger, better and quicker to mature.

*Conclusion: Even if commercial growing of fruit locally is out of favour there is a lot of potential for domestic and municipal production – in home gardens, public spaces, roadsides, allotments etc. The amount of fruit produced in the town could be significantly increased if edible fruit and nut trees were planted instead of ornamentals, both in gardens and in public spaces. Gleaning schemes could make sure that fruit does not go unpicked. TTW Local Food Group is promoting the restoration and care of fruit trees through its annual pruning workshops, growing fruit and vegetables in domestic permaculture gardens and at Eccelsden Mill Permaculture Plot, and the sharing of gluts, making of fruit preserves and juicing of fruit at its events. The town's first Community Orchard was planted at Cortis Avenue*

*in December 2011 and features traditional Sussex varieties of apple. Local schools are involved in tree-planting and forest-gardening, often including edibles.*

### **Fertility and diversity:**

It is widely acknowledged in farming circles that there is a fertility crisis as a result of industrialised farming methods reliant on artificial fertilisers. As well as 'peak oil', we are facing 'peak phosphorous'. At the same time, monoculture cropping has reduced species diversity and this is thought to be at least partly responsible for the decline of the honeybee, without which human life is impossible, since we rely upon it for most of the pollination of our food crops.

Paynes Bees, in Hassocks, have hives on the South Downs and they supply honey in Worthing at Easy Weigh, Hobdens and other shops selling local produce. In West Sussex we are lucky to have at least two large farming estates that are committed to organic farming, which relies upon putting fertility back into the soil naturally, through humus creation. The Sussex Wildlife Trust promotes conservation generally (and encourages wildlife-friendly gardening) and is now involved in creating a Local Nature Partnership, which should protect and enhance local ecosystem services and the environment. The South Downs National Park Authority is also looking at managing the unique qualities of the area in the face of competing demands.

We don't know how many domestic gardeners and allotmenters are organic but many people make garden or allotment compost, the best and cheapest way to maintain soil fertility, and many are aware of wildlife friendly planting and practices. Worthing has its first Community Wildlife Garden at Cortis Avenue. The Councils collect and recycle green waste to produce soil conditioner available at the recycling depot locally. Culberry Nursery produces compost, manure and mushroom compost on site for sale in bags. Pucka Muck collects stable manure from around the area and can supply in bulk or in bags.

*Conclusion: We can all reduce our dependence on agri-businesses by feeding the soil rather than the plants and by building natural pest control from species diversity. TTW runs a number of annual workshops on organic growing, many through Culberry Nursery, promotes permaculture and holds an annual spring Seed Swap, Sow and Grow event in February to encourage the saving of locally grown and adapted seed and the growing of as many different varieties as possible.*

### **Case study: Cowdray Home Farms**

Cowdray Home Farms is the base for the in-house farming operations of the Cowdray Estate, near Midhurst. Located within the South Downs National Park, there are 4000 acres of arable and dairy farmland, managed organically and registered with the Soil Association and Natural England's Higher Level Stewardship Scheme for long-term environmental improvement. Famous for its feature trees, Cowdray has also planted over 3000 metres of hedging since 2000. The Farm employs eleven full-time people with additional casual labour employed at peak times.

Home Farms pasture feed their cows and produce additional feed on the estate with very little bought in. Most of the milk they produce is sold to Dairy Crest and OMSCO which supply Sainsburys. Some milk is processed on the estate and sold through the Farm Shop and to other local customers. Potatoes grown supply Walkers Crisps. Cowdray wheat is used to produce artisan bread, baked daily on site for the Farm Shop Bakery and fresh organic meat from the estate is sold at the Farm Shop Butchery.

The Model Farm is an educational resource for children to learn about organic farming and the Urban Permaculture Garden on site teaches permaculture principles with the aim of inspiring town-dwellers to grow more food, medicinal plants, harvest water and generally be more self-reliant.

There are 6,000 acres of Forestry Commission Certified Woodland, the objectives being to produce quality timber whilst providing a haven for wildlife. The River Rother, which runs through the estate, is managed sensitively to maintain water and riverside habitats, and there is a thriving wild brown trout population.

Cowdray is also host to the first Regenerative Agriculture courses in the UK, taught by a world expert. This is part of their commitment to evolve beyond sustainability into a more regenerative and resource-efficient but profitable enterprise. Key to this farm-scale permaculture system is the management of rainfall and water in the landscape, to avoid both flooding and drought conditions, in order to produce deep, fertile pasture with the maximum diversity of species and a huge capacity to lock-up carbon in the soil. It also involves Holistic Management of the farm to reduce inputs from outside and leakage of profit, adding value to the enterprise, whilst ensuring that the farm provides a good life for its owners and thrives into the future.

## **The way forward - evaluating strengths & weaknesses**

### **Strengths**

- Natural assets of grazing downland, good quality horticultural land with advantageous light and mild climate, and resources of the sea (fish and seaweed 'compost') close to the town.
- Although there are now none within town boundaries, there is a thriving dairy farm within 15 miles of Worthing.



- There are a couple of large organic producers in the county, e.g. Goodwood and Cowdray estates, who have fairly strong 'closed-loop' production systems, requiring few inputs from elsewhere.
- There is a couple of fruit and vegetable box schemes supplying the town, some local shops selling local produce, fishermen selling from their boats on the shore and several farm shops, fruit farms and PYO enterprises nearby. (More detail in forthcoming section and local food guide.)
- There is considerable scope within the town boundaries to increase the production of fruit and vegetables in domestic gardens. This is being promoted by Transition Town Worthing (with initial support from Adur & Worthing Councils) through a 'Garden Share' scheme and through its Sow and Grow workshops.
- There are a number of community growing projects using alternative approaches to food production and providing opportunities for re-skilling. E.g. Culberry Nursery has a sister community growing project and offers courses and training (see case study below); Cortis Ave community garden in the heart of the town focuses on wildlife and diversity planting but also on education and community growing; Ecclesden Mill community garden is cultivated communally and offers permaculture training and experience.
- There are a number of council-owned allotments, albeit with a long waiting list and not necessarily cultivated organically, but with a wealth of experienced growers.
- Several schools have well-established growing, composting and tree nursery projects, e.g. Oak Grove College, Thomas a Becket Middle School.
- A number of public parks and green spaces could be used for growing projects and wildlife planting and the Local Strategic Partnership committed to enabling 3 community-led gardens on under-used public land in Worthing and 3 in Adur in 2012.
- A woodland regeneration proposal for a former landfill site is being investigated by Worthing Borough Council and Transition Town Worthing.
- West Sussex County Council produces a quarterly magazine, Taste, promoting local food producers and Sussex Foodie News also promotes local food.
- Worthing Borough Council is planning to hold the town's first Local Food and Drink Festival in July 2012.
- Several local producers have diversified their operations and found niche markets. This will become increasingly necessary, e.g. to supply timber for heating.
- Presence of an agricultural and horticultural college at the Brinsbury campus of Chichester college. They also launched a centre of excellence for regional food and drink in the South East in 2011, to support local farmers, producers, distributors, retailers and hospitality businesses in East and West Sussex, Hampshire, Surrey and Kent.

- There is scope for research into the amount we spend on food per household, which could support the local food economy.
- Worthing is a Fairtrade Town and lots of cafes etc use fair trade products.

### **Culberry Community, Angmering**

#### Local vegetable growing scheme

The community has about 15 members growing bio-dynamic fruit and vegetables for their own use. They work from 1 acre of land, about 7 miles from Worthing, including two polytunnels and a small glasshouse used for raising seeds. The only energy consumption is an electric mat for seed germination and fan heater for frost protection in the glasshouse. All cultivation is done with human power, no tractors involved. Most of the water used is collected from roofs and stored in several large tanks. Humanure from the Composting toilet is spread around the fruit trees, local stable manure is treated with bio-dynamic preparations and composted before be applied to the gardens. Potting compost is made from leaf mold and sterilized top soil. Seeds come from Stormy Hall seeds (East Sussex) and Moles (Colchester)

Benefits of the community are that new members or members with little growing experience can work with more experienced people and learn as they grow, there is a rota of members to come in each day to do watering etc so that members only need to come in once a week and holidays are covered also.

#### **Weaknesses**

- The farmed area in West Sussex is insufficient at present for a truly localised food system.
- Farmland owned by the local authority is an asset but it is at risk of being sold, reflecting the lack of a food, agriculture and living heritage strategy for the borough and county.
- The use of land locally needs to be assessed in relation to the various demands on it, the pressures of climate change and rising fuel prices. Our current food preferences and farming systems will need to adapt, e.g. we need to eat less meat, use more grain for human consumption rather than as animal feed, grow alternative protein crops etc.
- Commercial producers are at risk from rising fuel prices and climate change, e.g. transport cost of deliveries, use of powered machinery, unsuitability of certain crops for drier, warmer summers. They will need support to adapt and improve their resilience due to the high cost of installing reservoirs, photo-voltaics etc.
- There are not enough suppliers of certified organic supplies locally so they have to be bought in, e.g. compost. Other supply chain items also have to be brought in at present, with associated transport costs.

- The monthly farmers' market has been struggling, reflecting either low demand within the town and/or full capacity of producers who can sell all their produce more easily elsewhere, e.g. at the thriving, award-winning market in nearby Shoreham. This disconnection between consumers and producers perhaps needs to be addressed through different types of buying and growing schemes, e.g. Community Supported Agriculture (CSA).
- There is no permanent farm shop in the town itself (like Bill's of Lewis and Brighton fame or the Sussex Produce Store in Steyning) and until recently there was no producer selling direct through a veg box (there is now Angmering CSA).
- An absence of small holdings and market gardens within the town boundaries.
- A very small fishing fleet in Worthing now (more detail in future sections).
- The dominance of the supermarket model, for both consumers and producers, based on 'just-in-time' stocking which is vulnerable to disruption, low prices, convenience for car-users, rejection of 'imperfect' produce.
- Numbers employed and trained in agriculture, horticulture, forestry and fishing will need to increase and younger people need to be attracted. At present there is a total of 7,300 people working in farming in West Sussex, including full and part timers.
- Like everywhere else, we need to maintain ecological diversity.

### **Angmering Community Supported Agriculture (CSA)**

We were set up in 2011 by members of Transition Town Worthing and villagers from Angmering to grow sustainable locally produced food. We have just set up a steering group of seven members to oversee the project and to look for new growing sites. We currently grow on a small site at Culberry Nursery, Angmering, supplying vegetables to our members.

Members pay £20 per year, volunteer whenever they can (minimum 4 hrs per year) and get vegetables at a reduced rate. Culberry grow the produce for us, send out an email list once a week and deliver veg boxes to Worthing. There is also a farm shop at Culberry Nursery.

#### **Our vision**

- To grow and supply locally grown food for Angmering and the surrounding area.
- To make a sustainable growing and distribution network (financial & ecological)
- To adopt growing systems not reliant on fossil fuels which also encourage wildlife and beneficial insects.
- Community involvement in growing, education and social events.
- Generate employment for local people, providing a fair wage to growers and support staff.
- Minimal waste, recyclable packaging and processing surplus food.
- Forging links with other growers and suppliers to make local food networks.
- The future plan to include a mixed livestock, arable farming system.
- To have an outlet in Angmering village to help keep the heart of the village alive.

#### **Where our inputs come from?**

- Seeds from Moles Seeds, Kings Seeds, both at Colchester and CN Seeds, Cambridgeshire.
- Composts from Earth Cycle Chichester and stable manure collected locally.

- We save our own rain water in large tanks.
- The only heating is in the propagation house, which is gas with electric mats for starting off seedlings.
- We try to use recyclable packaging where possible, paper bags and biodegradable carrier bags from The Chichester Paper Bag Company. Cardboard boxes from Fargro Ltd, Littlehampton.

**Final Conclusion:** We need to have a local producers and consumers ‘conference’ to work through the following complex and sometimes contradictory issues:

1. We need to protect and increase the amount of farmed land in the area.
2. We need a land-use strategy to reconcile conflicting needs and have a ‘joined-up’ approach to housing, transport, food production and economy.
3. There should be support for producers to become more resilient and shorten supply chains.
4. New opportunities to diversify and fill gaps in supply chains must be found.
5. Farmers need to learn, from each other, how to adapt their practices and move towards holistic farm management, regenerative agriculture and closed-loop enterprises that will ultimately improve their livelihoods, communities and the environment.
6. Consumers need to support local producers. Maybe a declaration of food independence, like Colne Valley’s, ie, an aspiration to “become increasingly self-sufficient and independent of the global industrial food system.” But local food has to be affordable for everyone. This may need new buying models like CSAs, food co-ops, ‘People’s Supermarket’s’ etc.
7. There must be more urban food production, more people growing, harvesting and eating their own or their ‘neighbour’s own’, as well as commercial urban growing and shared, communal food production on public land.
8. We need to acquire personal skills but also train young people to take up careers in horticulture, agriculture, and related industries and place a higher value on this than currently.
9. We need to adapt our diet and food demands, eating more seasonally, locally and adventurously as well as wasting less food and eating less but better quality meat.

We would like to warmly thank all the farmers we interviewed and the other sources that we have drawn from to produce this snapshot of the food production elements of the local food web.